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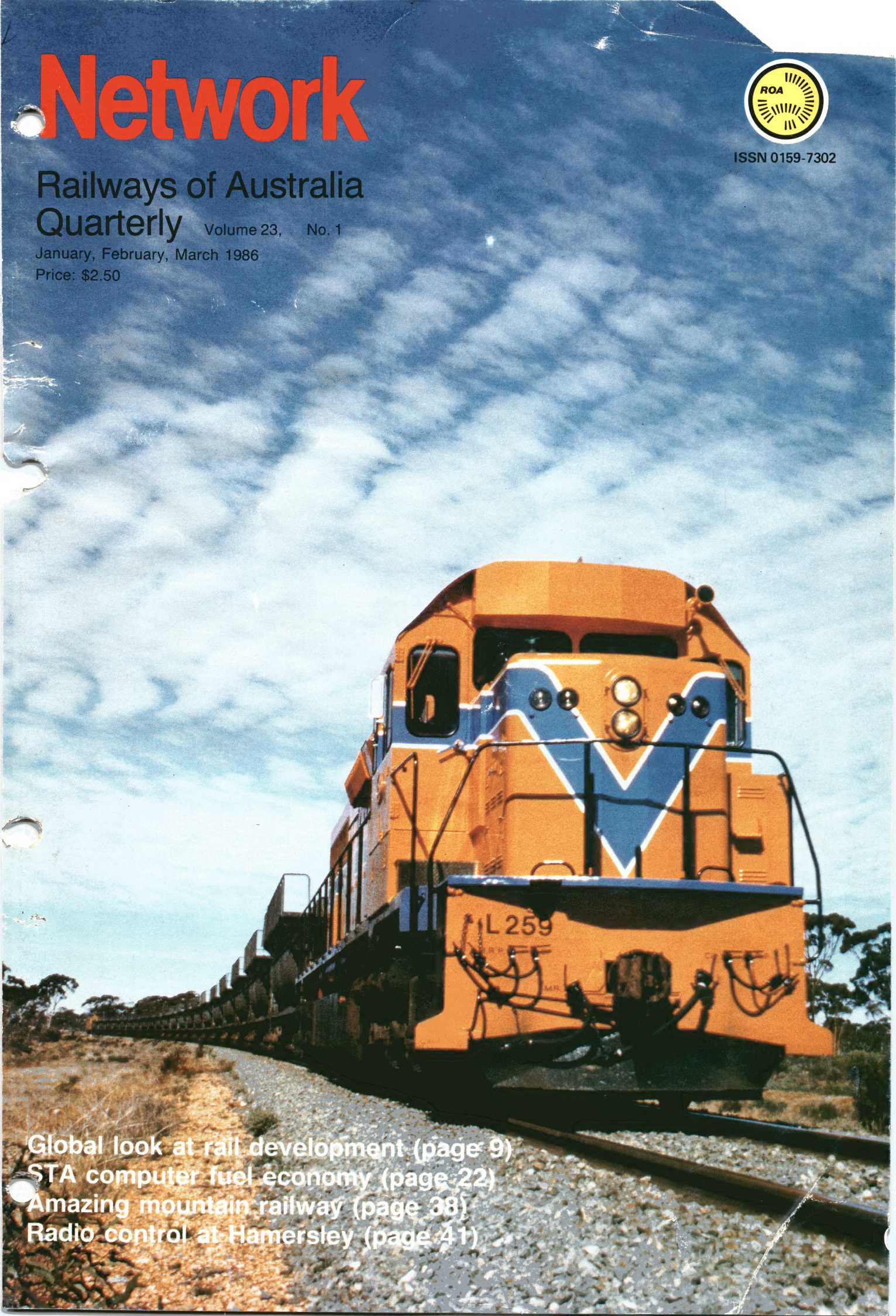

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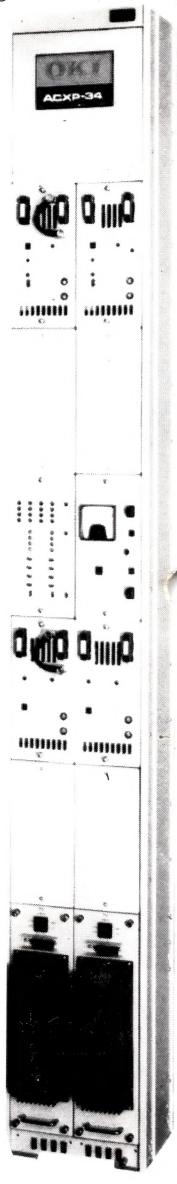

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Network

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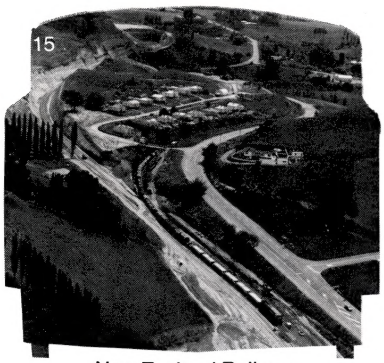

New Zealand Railways

State Transport Authority of SA

Queensland Railways

Contents

Front cover:

A Westrail ore train with its loco dressed in pristine livery colours.

Our only requirement of writers and personalities who contribute to Network is that they be informative or entertaining and that their subject has relevance to the wide interests of railwaymen today. Naturally, there will be occasions when their viewpoints or opinions run contrary to those of the editor or to Railways of Australia. We must accept that these differences are among the elements essential to the presentation of a lively and interesting magazine.

But for the little you save, you could be buying a lot of trouble. Unexpected failures, for instance. Added down-time for make-goods on repairs. Complications with what should be routine maintenance. Extra costs. Lost business. And that's just the basic check-list of what can go wrong.

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The
EXECUTIVE DIRECTOR'S
column

Another first for ROAC

One of the functions of the Railways of Australia Committee is to bring together railway personnel from all over Australia for discussion on points of mutual interest.

We have in our office (printed and leather bound) Minutes of Meetings dating back to 1897, when the topics included 'Pirating' of traffic from the Riverina by the Victorian Railways from the then New South Wales Railways.

Since that date Railway Commissioners and their senior staff have met on a regular basis — in a wide range of groups for specific reasons or for multi-purpose talks.

August 21-23, 1985 witnessed the inaugural Australian and New Zealand Railways Technology/ Research Conference, held in Brisbane.

This was a new style of railway conference, designed on professional lines, to bring together senior and middle management from technical and operating areas. They exchanged views on the modern aids to management which are so much a part of the Australian Railways scene. Some fifty Railway personnel took part.

Queensland Railways, the host System, provided excellent facilities at Railway Centre in Brisbane.

That modern management tool, the computer, has found a wide range of uses within the railway industry — and these were explored in the first part of the Conference.

A summary of computer applications from each of the independent Rail Systems was presented and discussed — there were papers on the use of computers within train control and in the simulation of intersystem train movements

The use of radio in rail safeworking was addressed by a number of speakers and experiences were exchanged.

Reliance on above-ground pole and wire telephone systems is disappearing in Australia and with our vast distances and outback conditions, radio forms a most practical alternative.

We may expect to see increased use of this medium as the years go by — in fact the new iron ore railways of the Pilbara region in Western Australia have relied on radio from their inception.

The conference program allowed time for delegates from each System to come together and consider how new techniques discussed at the conference could be applied in their own area.

Similarly, opportunity was provided for personnel from individual disciplines — engineering, accounting, operations — to meet individually and pool knowledge gained from each State.

The 1985 ANZR Technology/ Research Conference replaced the former Officers' Conferences which were held annually. It operated to a somewhat tighter schedule and to a defined purpose.

It was a success. The papers themselves — one of which is reprinted in this 'Network' — are being circulated not only to the participants but to interested officers throughout the Australian network. They provide a good summary of the experience of Australian rail in the use of modern management techniques.

In addition, the personal contacts made at gatherings of this type are invaluable — and many were made. The event was one with which Railways of Australia Committee is proud to be associated.

Michael Schrader

M. C. G. SCHRADER
EXECUTIVE DIRECTOR

M. C. G. Schrader

SRA Chairman Sir Lennox Hewitt (right at microphone) with Grafton Mayor, Gordon Jabour at Grafton Station.

Sir Lennox launches the new service with a bottle of champagne on the nose of XPT in Central Station, Sydney.

The XPT on the Grafton Viaduct.

NEW ERA OF TRAVEL

The N.S.W. Minister for Transport, Mr. Barrie Unsworth, has welcomed the start of a new era of rail travel to the North Coast of New South Wales.

Previously, the North Coast service had terminated at Kempsey and now extends to Grafton.

'Rail travellers wishing to journey either to or from the North Coast now have the opportunity to ride one of the world's best trains,' Mr. Unsworth said.

'The extension of the XPT from Kempsey is an integral component of the new deal for Country Rail Travellers.

"The 'New Deal' began in March with dramatic cuts in XPT fares (up to 48%) and involves greater utilisation of the XPT as well as the introduction of State Rail Authority coaches to country areas previously unserviced by Government transport.

'Grafton and Coffs Harbour are major centres on the rapidly developing holiday coast.

'The introduction of this XPT service from mid-October means that rail travellers to those towns now save between one and a half and two hours in travelling time.

'On the vital question of cost, the first class rail fare to Grafton is more than $60 cheaper than the normal economy air fare.

'In addition, air-conditioned road coaches connect Grafton to the

famous resorts of Byron Bay, Ballina, and Yamba.

'The whole of the north coast timetable has been restructured to more convenient times.

'The XPT now leaves Sydney at 8 a.m. instead of the previous departure time of 7.08 a.m..

'In the evening the Brisbane Limited and Gold Coast Motorail to Murwillumbah leave at 6 p.m. and 6.30p.m. respectively (8.50 p.m. and 7.15 p.m. previously).'

'All these services to the north coast are fully air-conditioned with on-train catering.

'For the first time the SRA now services the Gold Coast city of Tweed Heads. A super coach connects with the Brisbane Limited at Casino.

'The rail/coach fare to Tweed Heads is $57.30 compared with the normal economy air fare of $144, a saving of over $86.00.'

The Minister added that the new Northern Tablelands services commenced operation from mid-October.

A supercoach connects the North Coast Overnight Express at Grafton to Moree via Inverell on Mondays, Wednesdays, and Fridays.

The Armidale XPT operates three days a week with a diesel-hauled air-conditioned service running on another three days.

TO NSW NORTH COAST

Mr Keith Fitzmaurice

A global look at new railway development

While in some countries, principally developing nations, railways are an expanding means of transport, railways in First World countries are generally struggling to maintain market share and justify the large government subsidies.

This was one of the noteworthy trends observed by the Chairman of V/Line, Mr Keith Fitzmaurice, in discussion with world railway executives during a recent railway conference in Europe.

Mr Fitzmaurice, in May, as chairman of the Railways of Australia Committee and Australian and New Zealand Railway Conferences, attended the annual conference of the Union Internationale des Chemins de Fer (International Union of Railways) in Brussels.

Subsequently he visited railway installations in France and held talks with the management of British Rail in England.

Mr Fitzmaurice said the struggle of railways in some First World countries to maintain a market share was not invariable. For instance some segments of business in such nations fared better than others, as with the TGV in France, some inter-city services in Britain and Amtrak's North-East Corridor Boston, New York, Washington.

Poor road infrastructures, low incomes and generally high populations provide sound economic support for the growth of railway systems in developing countries. Rail is seen by these countries as an affordable means of transportation with little or no competition from alternative modes.

Mr Fitzmaurice said that, in many First World countries, long planning horizons in use of railways were increasingly being overtaken by the pace of technological and market developments. It would seem that the industry's culpable neglect of the customer for many years had been replaced by what was almost an over-reaction and awareness of the need to tailor travel products to the needs of travellers.

More and more purpose-built wagons and passenger rolling stock, and greater sophistication in market research techniques, were some of the manifestations of higher profile marketing approaches.

(continued next page)

TGV attendant serves breakfast at your seat

Rent-a-car delivered at TGV destination

Mr Fitzmaurice said: 'Most European railways, regardless of their operational and managerial effectiveness, and their new-found customer awareness, seem less concerned about 'bottom line' results that I had expected. They are certainly well behind British Rail, Amtrak and, for that matter, V/Line itself.'

He said considerable emphasis was being placed on increasing speed as a means of maintaining and expanding market share of inter-city travel in Europe. A railway philosophy in FR Germany of being 'twice as fast as the car and half as fast as the plane' was being pursued with great enthusiasm but apparently without a lot of economic justification.

He noted that in some places the concept of taking food to customers was preferred to buffet-dining cars, with the exception of longer distance travel. Higher turnover was achieved for sale of food and drinks 'at seat' than in the buffet.

In the tour of France following the congress, a day was given to a trip from Paris to Lyon on the world's fastest train, the 270 km/h TGV which is manned by a single driver and cabin staff.

Mr Fitzmaurice said: 'Traffic density for the TGV is enormous by Australian standards, with an average daily load of about 40,000 passengers between Paris and Lyon, Marseilles and Geneva. The French Railways (SNCF) state that the TGV runs at a profit and that extension of the service to other cities is now proceeding.'

The key to the success of the TGV was fourfold:

- dedicated high-speed-passenger-only infrastructure;
- purpose-designed rolling stock;
- high passenger density and travel times suited to train travel; and
- pride in achievement by both management and workers, which led to high levels of co-operation.

Mr Fitzmaurice said that, in England, an interesting measure of productivity used by British Rail was the number of 'train miles per employee' which currently stood at just over 1,000 miles a person a year; V/Line's figure, by comparison, was 720.

He said: 'BR sees the need for complete refurbishment of passenger rolling stock on a seven-year interval basis. The leisure market is judged to be that which offers greatest opportunity for growth.'

British Rail had recently reorganised its structure to place emphasis on the 'bottom line' results of its various businesses or sectors.

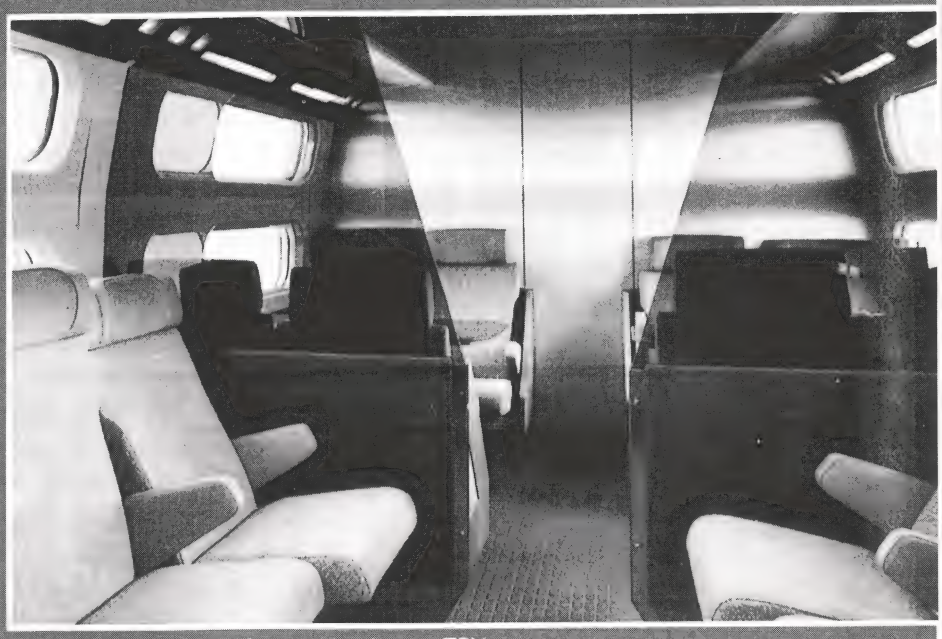
'Three of its sectors, Freight, Parcels and Inter-city are seen to be potentially profitable in their own right and are therefore described as commercial sectors. 'Provincial Services and London and South East are described as Social Railways and are subject to Government Grant aid.

'There is similarity between what British Rail is doing and what V/Line is doing — organisationally. It would appear that British Rail's information systems are in a more forward state of development than V/Line's. 'Bottom line' results are able to be reported every four weeks by business sector and by business sub-sector or product area.'

Interesting points about the management structure of British Rail included:

- a five-year Corporate Plan in which the commitment consisted of some 3600 separate action plans;
- a great emphasis on internal communications, with each issue of 'Railnews' reaching 70 per cent of the work-force and containing paid advertising including classifieds for staff wishing to sell, find holiday venues and so on;

Typical bar carriage on a TGV



Some first-class seats face each other on TGV

- heavy corporate advertising is being indulged in to persuade opinion formers that BR is well managed, is going places and meeting its objectives;
- the replacement plan for the BR locomotive fleet, whose average age is 20-25 years, is not expected to be completed for several years, after which the replacement program will run for about 25 years.
- some 20 per cent of BR's network is electrified, and this is slowly increasing.

Mr Fitzmaurice said British Rail was about to introduce the All Purpose Ticket Issuing Machines (APTIS) and the Portable Ticket Issuing Machines (PORTIS) which it will instal at more than 2500 stations in Britian during the next two years, in a 40 million pounds investment.

These machines would provide much faster ticket issuing, savings from ticket counters, accounts areas and ticket printing, and comprehensive revenue statistics.

Mr Fitzmaurice said he gained the impression that British Rail has significantly lifted its performance over the past two to three years. The need for competitiveness was recognised throughout the industry. He said: 'There may be areas where V/Line can learn more from BR — in information systems, communications, workshop methods, management training and overall philosophy.'

High speed prototype test run for 350km/h train

The prototype InterCity Experimental (ICE) trainset built by the German Federal Railway (DB) as part of its high-speed development programme was recently put through its initial paces near Munich.

This electric multiple-unit trainset, designed for a top speed of 350 km/h, will be used in the first stage to monitor the performance of a large number of components mounted together for the first time on this type of rolling stock.

The exercise will particularly involve checking the behaviour of new-design pantographs, running gear, intercommunicating gangways, as well as the computer-aided transmission of traction and braking instructions.

Tests on the twin ended powered-units were completed in August and attention until the end of September was focused on the full trainset (two powered units with three intermediate trailers).

Acceptance testing started on September 23 over the high-speed Gutersloh — Neubeckum section of the Bielefeld — Hamm line.

This test campaign will ultimately culminate in the development of a new generation of high-speed Intercity trains, to coincide with the opening of new DB lines in the early Nineties, with working speeds of 250 km/h.

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NZ Railways biggest m

Electrification of the central section of the North Island Main Trunk railway will ensure the most economic use of energy, and provide several social benefits, as well as help ensure that New Zealand has a most efficient and profitable railway network into the 21st century.

Integral with electrification of the NIMT from Palmerston North to Te Rapa, Hamilton, is a major overhaul and improvement of the line and installation of new signalling and communication systems.

Together with new locomotives the project — NZ Railways biggest single development since completion of the main line in 1908 — will cost $200 million.

Work Programme

Work on electrification of the first section of the line between Palmerston North and Marton, which began in 1984, is almost complete.

This section is scheduled to be extended to Taihape and in commercial operation by the end of next year.

Electrification will be operational to Taumaranui by mid-1987 and the complete link, from Palmerston North to Te Rapa, operational in 1988.

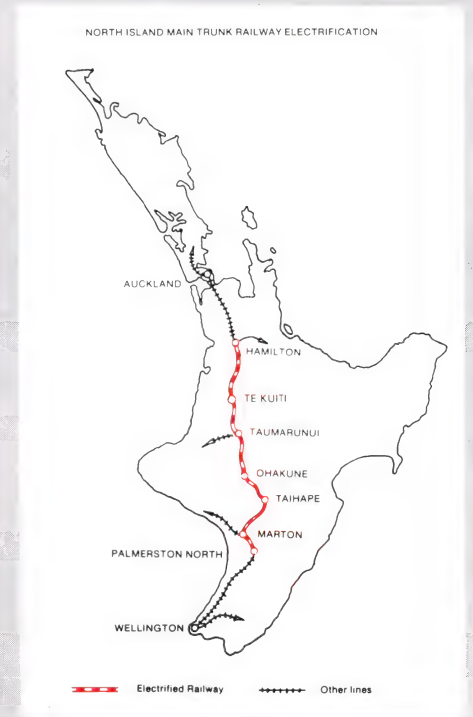
Track Improvements

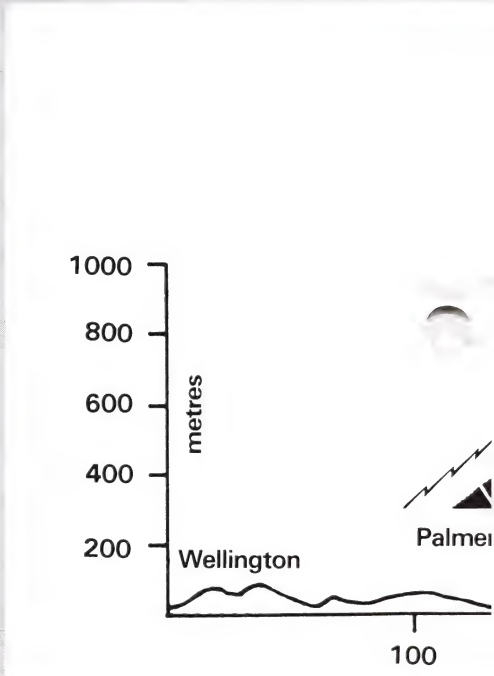
The decision to proceed with electrification has led to many major civil engineering projects, including massive earthworks, to improve the NIMT central section.

Some have been necessary to install the traction overhead and cope with electric locomotive axle loads, and others to obtain maximum benefit from the power potential of the locomotives which can haul longer, heavier trains faster than the current diesel powered fleet.

These track improvements include making it straighter and flatter through easing curves and gradients; alterations to 10 tunnels either by lowering floors or 'daylighting' — removing the earth above the tunnel; bridge and viaduct strengthening; and providing longer, and some new, crossing loops.

An example of the scale of earthwork involved is the daylighting of the





Makohine tunnel between Hunterville and Taihape. Some 375,000 cubic metres of earth had to be removed to turn the 180 metre long tunnel into a 50 metre deep cutting. Another project, which alone cost $14 million, is the nine-kilometre deviation replacing a tunnel and two ageing viaducts between Ohakune and Horopito.

It is improvements to the track such as these, together with the new signalling and communications systems, which will enable passenger trains, which will continue to be hauled by diesel locomotives, to travel faster between Palmerston North and Hamilton.

Electrification

Electrification primarily involves provision of the power supply from the national grid, installation of the traction overhead and the purchase of electric locomotives.

With electrification new signalling and communication systems, which like the track were already becoming saturated, also became essential.

Power supply over the entire 408 kilometre route will be supplied from the national grid by four new sub-stations.

The locations of these, dictated by existing sub-stations, will be at Bunnythorpe, North of Palmerston North; Karioi between Waiouru and Ohakune; Taumaranui and Te Rapa.

Power supply contracts were awarded to a number of different manufacturers including GEC Switchgear International (UK/NZ), Canterbury Engineering (NZ), Tyree-Power Construction (NZ) and Olex-Canzac Cables Ltd.

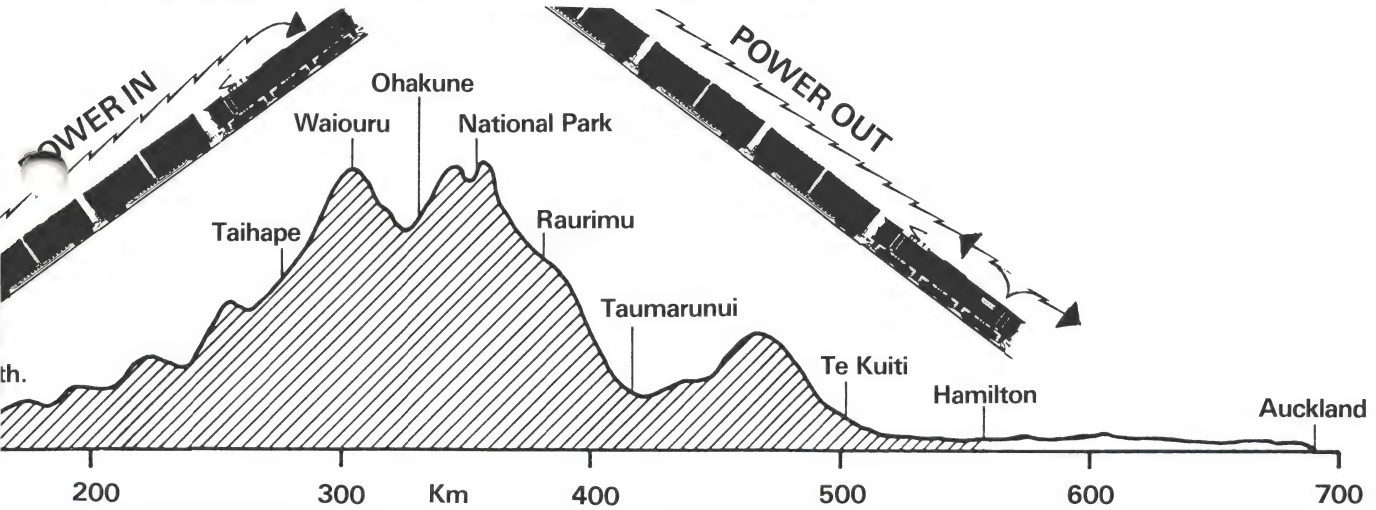
Traction overhead wires, carried on reinforced concrete poles, include a protection wire to give an assured path for fault current, the catenary system and the auto transformer feeder wire. The overhead contact wire is raised at each road crossing to allow passage of high loads within official height limits. Over-height loads can cross the railway by special arrangement. This provision is particularly important in certain areas where the main trunk railway crosses the main highway running through the centre of the country.

At each crossing the safe maximum clearance will be clearly indicated on roadside warning signs.

Apart from safety precautions such as this applying specifically to road users

ainline task since 1908

North Island Main Trunk Railway
REGENERATIVE BRAKING



a public awareness safety campaign, including schools' programme, is proceeding as electrification progresses. The whole overhead system is controlled from Palmerston North where new buildings house a control room, locomotive overhaul pot, workshop and facilities for overhead maintenance staff.

A key component of the control room is a large mimic diagram which indicates the overall condition of the traction power system.

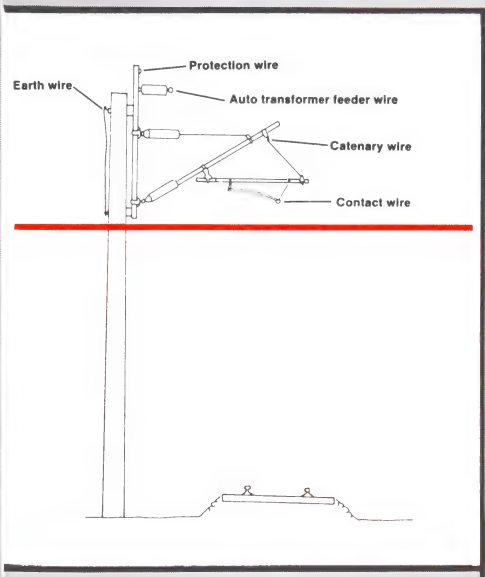
Detailed monitoring is provided using video display units which enable operators to focus on particular parts of the system. A completely new communication system is being installed primarily because the existing open wire pole system, which runs parallel with the track, would be subject to reduced voltage and noise interference.

The old system is being replaced with an electronics/laser-age optical fibre cable system.

Optical fibre cable technology, or fibre optics, was first used in New Zealand Railways on the Paekakariki-Paraparaumu electrification project completed in May, 1983.

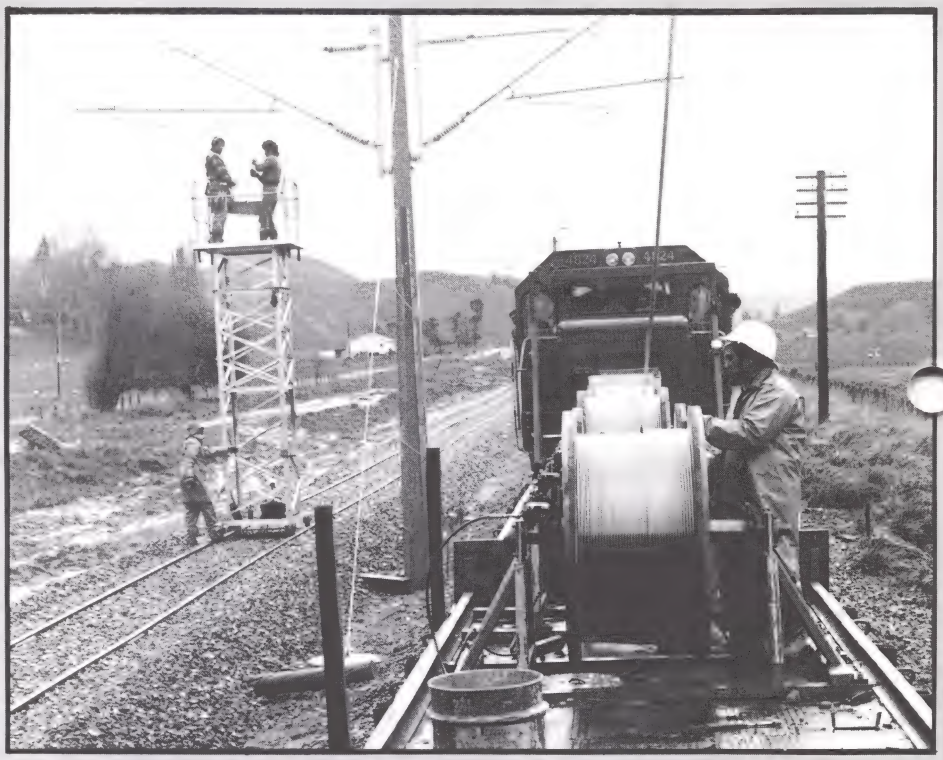
(continued next page)

An example of earth works to improve the NIMT railway. This picture taken of Farm Settlement, north of Taihape, shows a freight train using the track completed in 1908. The straighter, flatter new track line is seen to the left.



Instead of transmitting signals as electrical impulses through copper wire, fibre optics uses laser light impulses transmitted through thin threads of glass fibre.
This technology is not susceptible to electrical interference which means optical fibre cable can be laid alongside electric power cable.
Fibre optics also offer other advantages of particular value to Railways.
Cables can simultaneously transmit voice, video and data signals for many kilometres before the signal needs regeneration or 'boosting'.
Another advantage is that optical fibre cable occupies a fraction of the space of traditional cable yet has a far greater carrying capacity.
The optical fibre cable link, which when completed will be one of the longest in the world, will provide the data and telephone capacity Railways will need to cope with the expected growth of NIMT traffic.
Major contractors involved in various aspects of electrification include McConnell Dowell/MCE, a New Zealand/Australia joint venture supplying the traction overhead; Westinghouse McKenzie-Holland (Australia) supplying signalling; and Westinghouse Signals (UK) supplying communications. The 22 new AC electric locomotives being supplied by Brush Electric Machines, a Hawker-Siddeley group company, will be known as the 30 class and will be the most powerful ever to run in New Zealand.
They will be of the triple bogie type (Bo-Bo-Bo) with a 500 kW (670 hp) traction motor on each of the six axles, giving a continuous power rating of 3000 kW (4000-plus hp) at 42 km/h.

Concrete poles and overhead wires installed for electrification of the central section of the NIMT.



A special worktrain was assembled and adapted to install part of the traction overhead. This wagon is carrying the supporting catenary and contact wires.

The 30s which weigh 108 tonnes will be able to haul 1000 tonnes up the Raurimu spiral, the steepest section of the track, and up to 1200 tonnes on all other grades.
By comparison the 98-tonne DX diesels, which are rated at 2050 kW (gross), have a load limit of 720 tonnes.

Benefits

For Railways electrification was seen initially as the best way to avert the impending saturation of the NIMT.
More recently, as deregulation of the transport industry proceeds, electrification has gained much greater emphasis in Railways strategy to compete effectively with other

The electrification worktrain in use on the Makohine Viaduct.

forms of transport and maintain profitable operations.

Electrification and track improvements will enable freight trains to cut the time taken to travel between Palmerston North and Hamilton by as much as three hours.

This means better services for freight shippers as well as better track and wagon fleet utilisation for Railways.

Electric locomotives have a much greater hauling power than their diesel equivalent and are cheaper to run which will also cut operating costs.

Further economies will be achieved because electric locomotives require less maintenance, less frequently, than diesels.

Because of the general track upgrading passenger services will be more comfortable as well as appreciably faster. Benefits to the nation arising from electrification are primarily through reducing overseas expenditure, lessening the dependence of our economy as well as of the transport industry on overseas fuel supplies, and through the most efficient use of indigenous natural resources.

About 40 percent of all freight carried by rail moves over the NIMT and about 22 percent of all diesel consumption by Railways — equivalent to about 20 million litres of fuel a year — is consumed over the central section. Estimates in 1981 indicated that by reducing oil imports electrification will save $8.5 million in the first full year of operation, and $108 million in 10 years.

Future fares and freight rates will be less likely to be affected by fluctuations in overseas oil prices.

Other economic benefits are related to work for New Zealand suppliers and contractors and employment during the four-year construction period, new careers in Railways and prospects for the export of electrification 'know how'.

A major environmental benefit arising from electrification will be through using hydro-electric power, New Zealand's own clean, renewable energy resource, instead of oil.

Electric locomotives are quieter and cleaner as well as pollution free.

Electrification will extend the ability of freight trains to minimise road traffic congestion as well as pollution.

Throughout electrification all possible efforts have been taken to ensure the least damage to the countryside.

Earthworks which have scarred the landscape are being re-grassed and turned back to their original condition as much as feasible.

Particular care has been taken in areas of special importance such as National Parks — Railways has been assisted in environmental studies and assessments by the Auckland consultancy Kingston, Reynolds, Thom and Allerdyce. Throughout the length of the new track the scenery will have been improved by the replacement of old timber and rail power and telephone poles, generally considered an eyesore, with the new concrete traction poles.

This diagram highlights two key aspects to electrification of the central section of the NIMT railway — why electrification of the whole length of track is not currently being considered, and energy conservation through regenerative braking. About 40 percent of all rail freight is hauled along the 408 km between Palmerston North and Hamilton, which includes some of the most mountainous terrain in the North Island, where the greater power of the electric locomotives can be fully utilised. The benefits of electrification would be far less significant on the flatter country between Wellington and Palmerston North, and Hamilton and Auckland where the pulling power of the electric locomotives would be under utilised and the present diesel locomotives can cope adequately.

Electrification and modern electronics allow energy conservation through regenerative braking — locomotives when going downill can convert energy to electricity for use by other trains in the area. In the hilly country in the centre of the North Island as much as a fifth of the energy required could be recovered in this way.

. . . and 3000kW tribo

While the wires are being strung up along New Zealand Railways' North Palmerston line to Ohakune and Te Rapa, Brush Electrical Machines of Great Britian is busy fitting out the first of 22 Bo-Bo-Bo electric locomotives to work the route. NZR plans to test the first loco on a 47 km section with 25 kV 50 Hz catenary between Palmerston North and Marton during the first few months of next year.

Contracts for the locos were placed in December 1983 as part of an electrification package worth $NZ200m. NZR retained Hawker Siddeley Rail Projects as consultants for the job, and two other Hawker Siddeley companies also won orders: Westinghouse McKenzie Holland is supplying signalling equipment, and Westinghouse Signals of Chippenham in Great Britain is providing telecommunications.

Overhead catenary for the first 185 route-km is being furnished by an Australian — New Zealand joint venture, McConnell Dowell MCE GEC Switchgear International won the power supply circuit breaker contracts, and three New Zealand companies are providing autotransformers, cables and fittings.

Contracts for signalling telecommunications for the 225 route-km second stage between Ohakune and Te Rapa have been awarded to the first state contractors, but the overhead contract for this section has yet to be placed.

Shipment of the 22 locos will be spread over two years with the last scheduled to arrive in 1988, by which time the wires will have reached Te Rapa. The batch will suffice to work all through traffic over the 1,067 mm gauge route, which is characterised by steep grades and sharp curves at the foot of the Kaimanawa and Rualine mountain ranges. The line passes through the Tongariro national park, reaching an elevation of 885 m near the 2,797 m high peak of Ruapelni, the highest mountain in North Island.

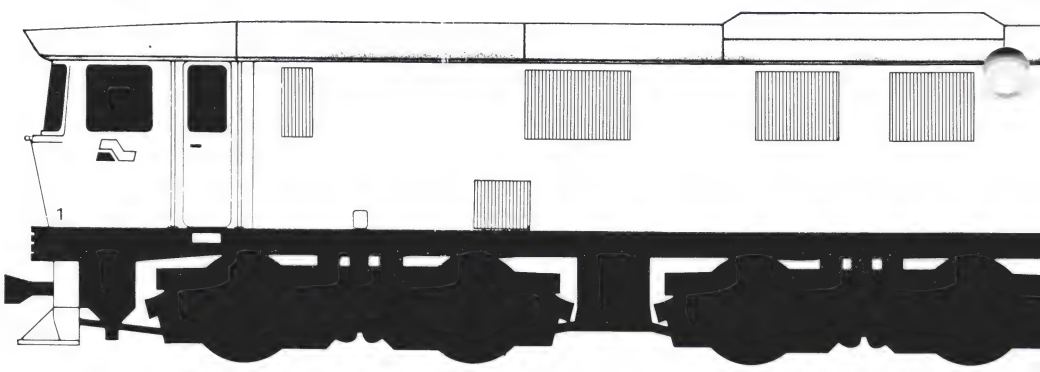
Specification

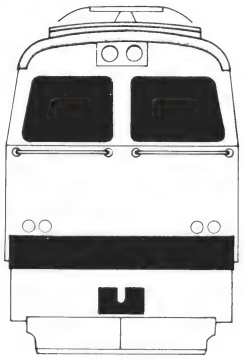
NZR's specification included the ability for a single loco to handle a 1,000 tonne load over the grades between Marton and Taumarunui and up to 1,200 tonne train on a 1.6 per cent grade and accelerate it to 42 km/h, and also to haul 1,000 tones at 90 km/h on level tangent track.

The design selected has a continuous rating of 3,000 kV at 42 km/h with a maximum tractive effort at starting of 300 kN. About 28 per cent adhesion will be attained during starting under average rail conditions, reducing to 25 per cent at the continuous rating.

Regenerative braking

Because of the long grades on the North Island trunk line, NZR decided to adopt regenerative braking. This is designed to hold a 1,200 tonne train to 40 km/h on a 2 per cent downgrade. NZR anticipates a





123
456
7890

locos chosen for task

worthwhile saving in power consumption thanks to regenerative brakes. The locos will be fitted with SAB brake units controlled by Davis & Metcalfe air brake equipment. D&M is also providing wheelslip and slide control.

Because of the ubiquitous sharp curves, NZR chose to adopt the tribo wheel arrangement as it favours low flange and rail wear; it also spreads the 108 tonne weight of the lock, so avoiding the need to strengthen a number of bridges and other structures on the route.

It was originally envisaged that cross-braced bogies would be used. Studies have since shown that the advantages of good curving and stability in a traction application of cross-bracing do not outweigh the extra mass and higher maintenance costs. To allow lateral displacement in curves, the bolster of the middle bogie has no fixed centre, lateral restraint being controlld by spring deflection damped by shock absorbers. The outer bogies are relatively still to control body yaw and keep the loco inside the tight loading gauge. Bolsters locate in the body with a central pin.

Primary suspension consists of steel coil and rubber roll springs with secondary suspension formed of laminated rubber and steel Flexicoil springs assisted by vertical and inclined hydraulic dampers. Bogies have fabricated steel frames with a 2,500 mm wheelbase and 1,100 diameter wheels when new.

Body Structure

The twin-cab monocoque body structure is designed to withstand a static compression load of 200 tonnes at the central drawgear, with the front end capable of resisting a 40 tonne load at window level and a 30 tonne load at centrail level simultaneously. Pressurised equipment compartments ensure that dust does not damage sensitive components. Insulation helps to prevent the build-up of heat from the sun.

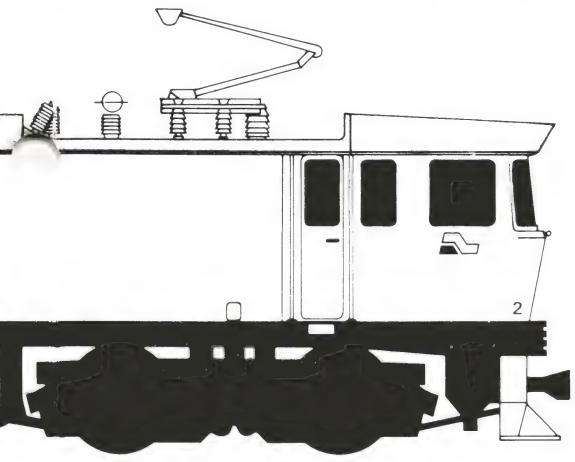
Braking and traction forces are transmitted between body and bogie by low level traction rods to ensure minimum weight transfer.

Electrical equipment

Current is collected from the overhead line from a single Breknell-Wills pantograph; voltage variation is from 19 to 28.5 kV, with a short-term minimum of 17 kV. From the pantograph current passes through a vacuum circuit breaker, roof bushing and high tension cable, terminating at a plug-in connection to the main transformer.

The nose-suspended four-pole de TM2191A traction motors are separately excited and force ventilated. They are arranged in two groups of three, with each group being fed from two separate secondary windings on the main transformer through a thyristor

(continued on page 21)



Electric Locomotive Specifications

Length over couplings	19,610mm
Width	2,700mm
Height over housed pantograph	3,950mm
Weight	108 tonnes
Axle load	18 tonnes
Continuous power output at rails	3,000 kW (4000 hp)
Maximum continuous tractive effort	256 KN at 42 kph
Wheel arrangement	Bo Bo Bo

CODE No.		RANGE
10 A 11	Ext. Grey	B.S. 4800
08 E 51	Yellow	B.S. 4800
592	International Orange	B.S. 381C
00 E 53	Black	B.S. 4800
00 E 55	White	B.S. 4800

CAB AND SUPERSTRUCTURE INTERIOR

10 A 03	Int. Grey	B.S. 4800

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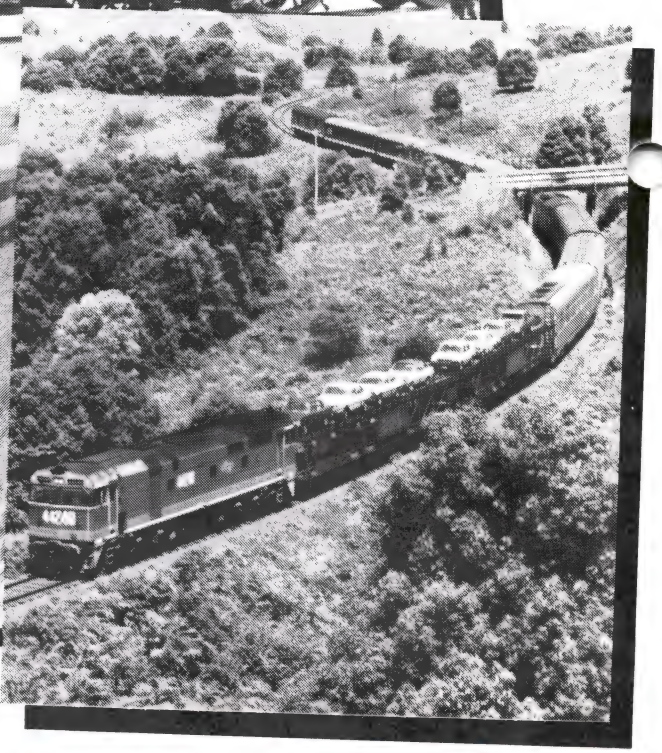
Canberra-Sydney XPT in Southern N.S.W.



Gold Coast Motorail, Byron Bay.

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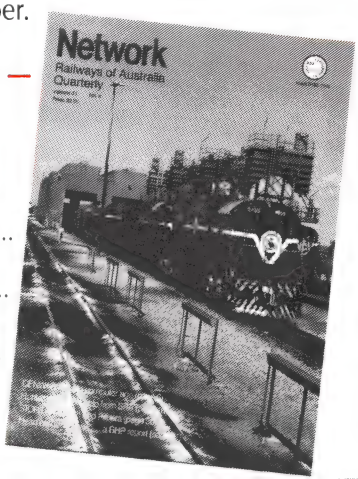


Nearing completion in the Loughborough workshops of Brush Electrical Machines is the first of 22 Bo-Bo-Bo electric locomotives destined for New Zealand Railways.

(continued from page 19)

bridge circuit with power factor correction.

Each group has a smoothing reactor, braking resistor and blocking diode to prevent circulating currents between the parallel-connected armature circuits. The traction motor fields, all supplied from a winding on the motor alternator, are each fed from a separate reversible bi-phase thyristor converter.

Neutral sections in thyristor circuits are automatically ramped off with power being removed and restored without driver involvement. The control circuits for the main converter bridges are designed to minimise the harmonic currents in the overhead. Two speed fans for the transformer and converter radiator contribute to keeping down noise in stations, with overall external noise levels of no more than 90 dBa.

A separate transformer winding supplies a motor-alternator set with a 230/400 V 50 Hz three-phase output for the blower motors, oil pump motors and air compressor motor.

A 230 V 50 Hz single phase supply will provide cab heating and power the headlights, with a 110 V dc supply being used for battery charging. Pairs of locomotives can operate in multiple.

The locos are fitted with fault annunciators in both cabs which are able to record 42 possible fault conditions in the transformer, converter, traction motors and other equipment. A 'black box' event monitor provides a continuous record of speed up to the maximum of 105 km/h; it also covers air brake operation, vigilance acknowledgements and movements of the power and brake controls.

The electronic vigilance equipment ensures that the top speed is not exceeded, and VHF radio offers communications between the driver and signalmen.

A flashing light is activated by the air whistle to warn motorists at level crossings of the approach of the train.

A new computerised system developed in South Australia has enabled significant savings in the use of diesel fuel to be achieved in regular suburban railway passenger services.

Manufacturers are now being sought for commercial production of the system under licence, and further development is planned for the technology to be applied to long haul freight trains.

The first of its type in the world, the system uses an electronic display in the driving cab to optimise energy utilisation within the constraints of the route and timetable.

Developed in conjunction with South Australia's State Transport Authority, the system is applicable to urban trains of any type, whether diesel or electric. The STA is purchasing two production units for driver training.

The system is the outcome of eighteen months of development work by researchers at the South Australian Institute of Technology with assistance from STA staff and a mathematician at Flinders University. It was funded by the State Government which placed a high priority on conserving diesel fuel, and was co-ordinated by the Computer Applications Centre at the SAIT Levels Campus.

The project was the brainchild of Professor Ian Milroy of SAIT who established the theoretical basis of the system whilst working at British Rail's research laboratories.

Hooded LCD above railcar control panel instructs driver on best driving technique for fuel economy under prevailing running conditions.

The device, tested on an Adelaide suburban MAN powered 2000 class 'Supertrain', is intended for passenger services where routes, timetables and train consist can be precisely defined.

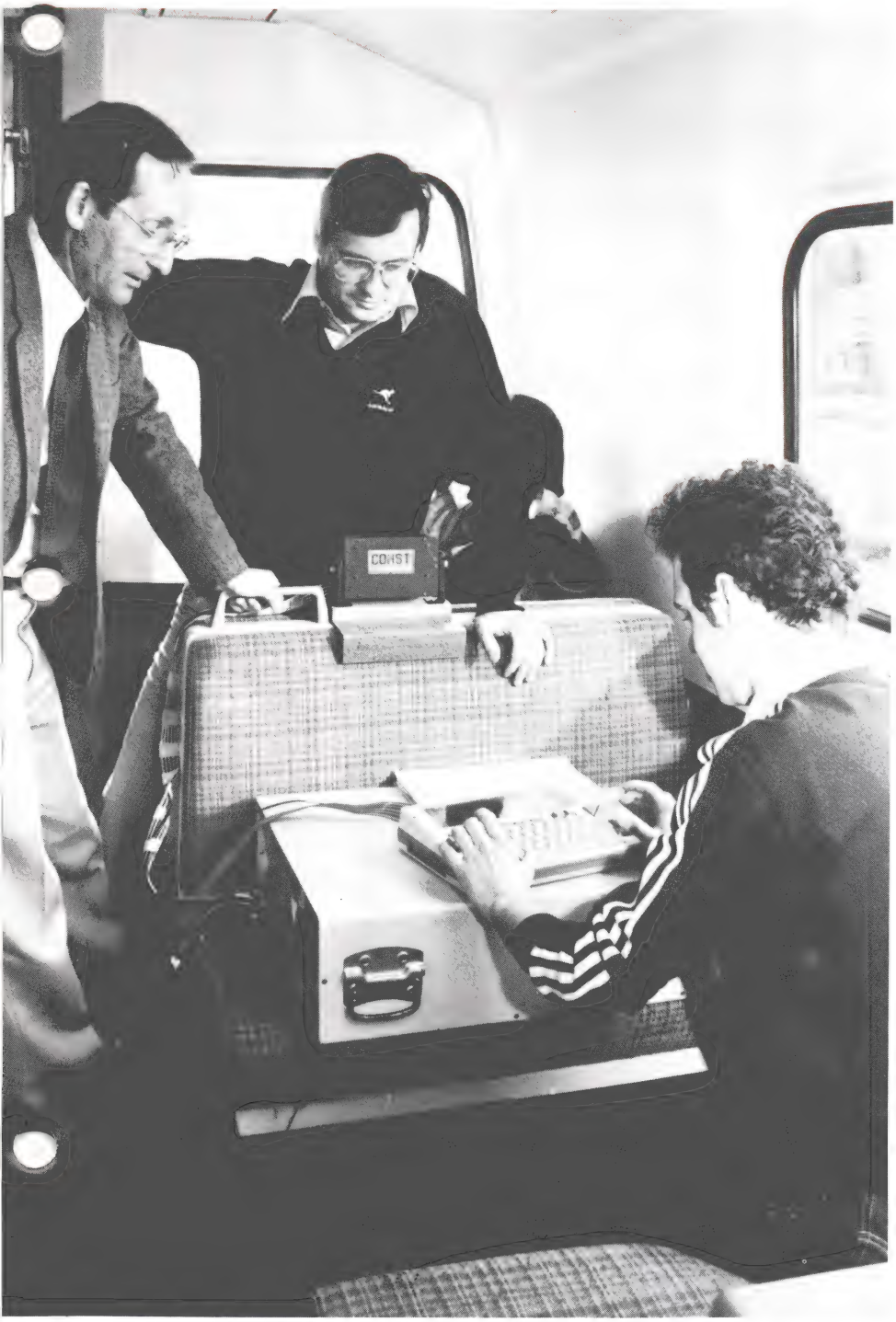
During the eighteen months of development a portable computer system has been assembled and programmed. The computer plugs into a driver display unit mounted in both end-cabs of the railcar.

Liquid crystal displays give clear and simple advice to the driver in the form of commands such as "ACCELERATE", "COAST", "HOLD SPEED XX", "BRAKE", together with a warning tone.

The computer is programmed to display commands which indicate at any point on the rail network the most fuel-efficient way of driving the train within the limitations set by the timetable.

To achieve best fuel consumption the computer takes advantage of the

Computer aids fuel economy on STA train



Portable computer equipment for on-train data logging of route and monitoring tests. From left: Dr Jaroslav Kautsky, mathematician, Flinders University, Mr Andrew Long, project co-ordinator, SA Institute of Technology, Mr Peter Pudney, programmer.

"recovery" time built into timetables to assist on-time running.
Thus the computer adjusts the timing and nature of its advice to the driver according to whether the train is early, on time, or running late.
The railcar chosen to be the test train was specially wired up by STA staff so that the development computer could be powered from the train's generator and also pick up various signals representing fuel consumption, velocity and the actual driving mode.
Thus the test computer could also act as a data logger so that the train's performance and fuel consumption is accurately monitored.
After any test run the complete journey log could be printed out and studied at leisure.
Tests on the STA train on the Adelaide-Gawler Central route confirmed the theory that an electronic display for drivers driven by an on-board computer is feasible and can provide accurate advice on efficient driving tactics. Also it has been shown that significant savings in fuel can be made if this advice is followed.
By comparing runs with drivers following the display to earlier runs without an advisory display, savings in fuel consumption of 10-15 percent were recorded.
Further, it was established that advice on fuel-efficient tactics could be conveyed to drivers in real time, without adverse human factors which might affect the safe conduct of the train or passenger comfort.'
With the completion of mathematical modelling, data logging and on-board testing of the system, the next stage was to build a small instrument for installation in each railcar, each instrument having its own inbuilt processing capability.

(continued on page 24)

Project co-ordinator Andy Long shows underfloor mounted recorder for measuring diesel railcar fuel consumption.

Mathematicians, engineers, STA operations staff, as well as computer experts have been working together with the drivers' union, the AFULE, involved right from the start.

Drivers have been enthusiastic about the idea because they see it as an enhancement to their driving skills, to achieve fuel economy, rather than deskilling of their work.

Once the instruments are in regular service it is a simple matter to update operating parameters to keep pace with changing track, route or timetable criteria.

Mr Bob Taylor, manager of Techsearch (the research and development arm of SAIT) said: "We are now applying to the Australian Government for further research grants, because we believe a similar approach can be applied to other railway operations.

"There is considerable potential for the system to be developed for long haul freight trains to gain energy savings for increased competitiveness with road transport.

"For that reason, the report on the project is being provided to other Government rail systems," he said.

The project was completed by Techsearch within budget and in two months less than anticipated.

'Manufacturers now being sought for commercial production of the system.'

Mr Taylor said the project demonstrates how technology transfer can work, using a tertiary institution and a commercial operator with funding provided by Governments.

"The whole project has been a classic example of combining a mix of disciplines and the expertise of different authorities to develop a new product — and that is the aim of the SAIT Computer Applications Centre.

"With potential worldwide sales at stake, we are seeking commercial exploitation of this technology through a licensee," he said.

Released by: Techsearch Inc.,
SA Institute of Technology,
North Terrace, Adelaide, SA 5000
Tel: (08) 228 0257 or 228 0258
Telex: AA82565
Further Information: Mr R. J. Taylor, Manager, Techsearch Inc. as above.

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Introducing two of AN's

One of the most versatile units at Australian National's Islington Rail Freight Terminal, Adelaide is a 25-tonne mobile forklift named the 'pig' because of its heavy appearance.

In charge of the 'pig' is Colin Young (50) who has 10 years experience with heavy earth moving equipment, including bulldozers and tractors, and worked on the construction of the Tarcoola to Alice Spring line.

The unit is an important asset at the Terminal because of its mobility and flexability.

Its two massive forks can lift 8ft, 12ft and 16ft containers and with the use of an adaptor can lift 20ft and even 40ft containers.

It has a tare weight of 35 tonnes most of which is carried low to the ground at the back of the fork lift.

Cars, caravans, machinery, steel products, and ATCO huts are all part of a day's work for the 'pig'.

The more mobile 'pig' complements this 32 tonne capacity gantry crane which can only operate on fixed tracks.

The forklift works hand-in-hand with the gentry crane and relieves pressure on shunting crews required when wagons are to be moved under the crane for either loading, unloading or transfer.

During a recent three-month period over 6,000 individual units were handled by the crane and forklift.

Automatic locking devices, fitted to the forklift's spreader, results in easy attachment to containers and considerable time saving.

Man with the best view of Australian National's Islington Rail Freight Terminal, Adelaide, is gantry crane operator Mick O'Donnell.

Perched 10 metres high, his air-conditioned cabin provides him with an excellent perspective of gantry crane and terminal operations.

Mick (37) has plenty of experience in the heavy machinery area and was once a truck and bulldozer driver.

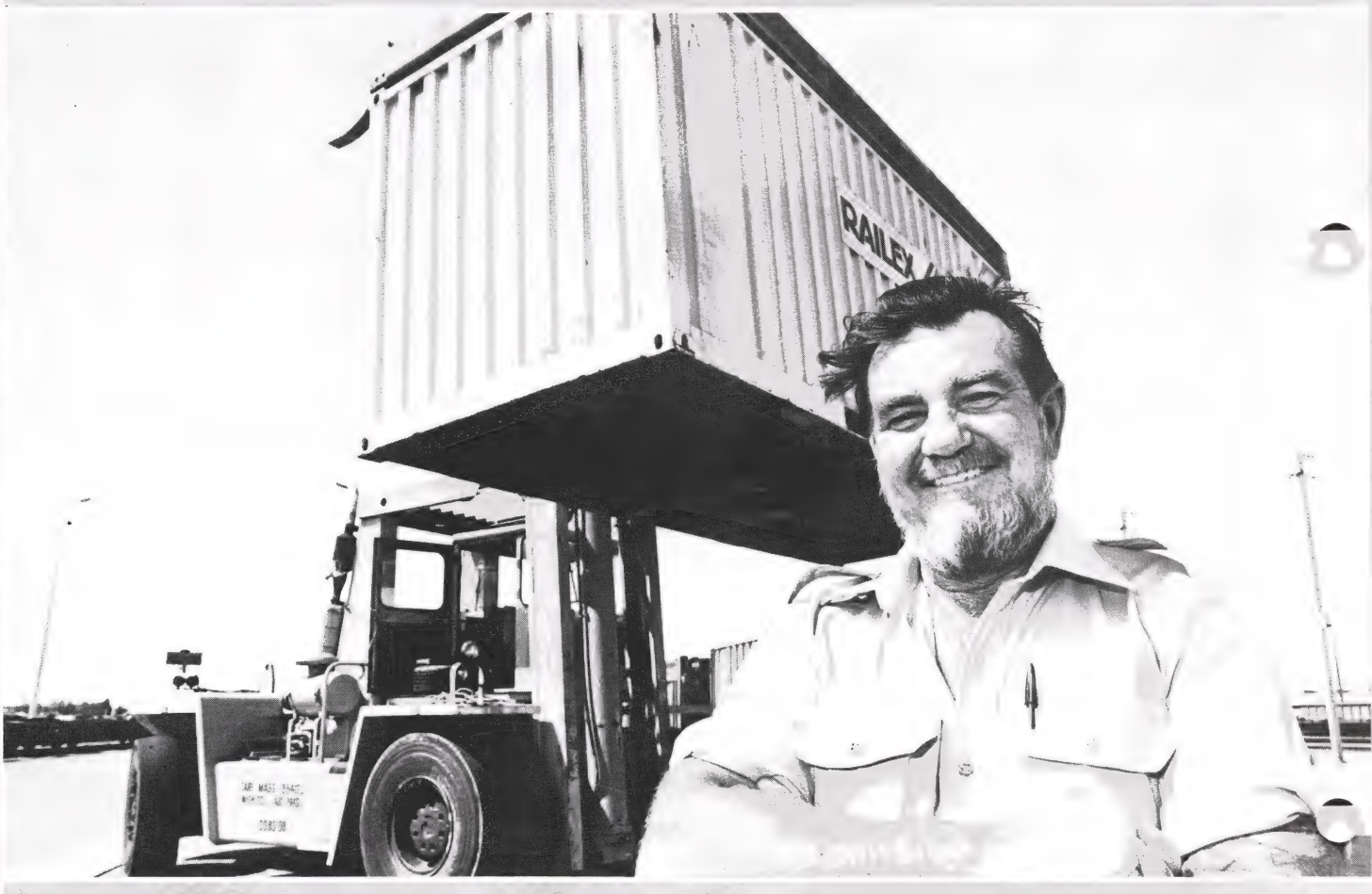
Aided by his slingers, he handles some 100 units daily, some of which may be lifted more than once.

Towering above the surrounding complex, the 32-tonne electric crane — installed when the terminal was constructed — operates six days a week.

It is used to load and unload cargo trays and containers from road or rail. These units can be 6.1m, 11.2m or 12.2m in length, fitted with bottom or top lifts. The use of chains and hooks also enable a variety of smaller lifts.

Because the gantry crane straddles a dual standard and broad gauge track loadings from either gauge are possible.

On average 20 to 30 containers are transferred off incoming broad gauge wagons from Victoria on to standard gauge flat wagons suitable for the high speed run to Perth. This operation is usually completed in about three hours.



Colin Young and the 25 tonne "Pig."

heavy load experts

Mick O'Donnell in the crane's 10-metre high cabin.

Doug Mendoza to retire

Queensland Railways' sixteenth Commissioner, Mr. D.V. (Doug) Mendoza will be retiring on 10th January, 1986, after completing almost forty-seven years with the Railway Department.

Mr. Mendoza commenced his Railway career as an apprentice turner at Ipswich Workshops and while serving his apprenticeship undertook night studies at the Brisbane and Ipswich Technical Colleges to obtain a Queensland University Diploma in Mechanical and Electrical Engineering.

After serving his apprenticeship Mr. Mendoza was employed as a Draftsman and in 1950 became Assistant Mechanical Engineer at Willowburn Workshops, Toowoomba. Later he was to become a Designing Mechanical Engineer at Ipswich and then Comptroller of Stores at Redbank.

He occupied the latter position some 2½ years and was then appointed General Manager of the South Western Division, based at Toowoomba, a position he held for 10 years.

From Toowoomba, Mr. Mendoza moved to Assistant Commissioner. It was in this posting that he became responsible for ushering in the suburban electrification project which saw Brisbane's train services upgraded to world standards.

On January 13, 1983 he became Commissioner climaxing a notable career as an administrator, planner and a man respected by all who came into contact with him.

Perhaps the highlight of Mr. Mendoza's railway life came this year when Queensland Railways announced an operating profit of $107.8 million, an all-time record performance.

D. V. (Doug) Mendoza

While he still has some weeks to go before he does call it a day, Mr. Mendoza is still the futurist and is planning to make the most of retirement with his hobbies of golfing, gardening and fishing.

New rail travel centre at 'Surfers'

'Rail business in Surfers Paradise has increased 50 per cent in the last three years,' the Executive Director of Railways of Australia, Mr. Michael Schrader said recently.

Mr Schrader officially opened the Railways of Australia new Rail Travel Centre, Cavill Park Building, Surfers Paradise.

'This dramatic increase required new facilities to cope with the demand,' Mr Schrader said.

'It will have the capacity to handle the extra business because it is linked by computer to reservations systems in NSW, Queensland and Victoria.

'For the first time NSW railways has extended its operations to Tweed Heads.

'In addition, the capacity of the Gold Coast Motorail has been greatly increased.

'These improvements will encourage more people to travel to and from the Gold Coast region by rail.'

The centre was furnished at a cost of $21,000 to which all the rail systems contributed.

Queensland Railways' 1460-class diesel-electric locomotive heads north from Nambour with a long-distance freight train. QR's single track North Coast, equipped with CTC, carries very heavy traffic.

SRA's TANGARA D

The N.S.W. Minister for Transport, Mr. Barrie Unsworth, recently unveiled the design for the new generation of Sydney metropolitan trains, the Tangara.

The Minister said that earlier this year the Premier, Mr. Neville Wran, had announced the Government's allocation of $500 million for the construction of 450 Tangara carriages with the first scheduled to come into service in 1987.

'This is the train that will carry Sydneysiders into the 21st Century,' Mr. Unsworth said.

'Sydney is the world's most beautiful city and deserves the most spectacular train. The Tangara will make our metropolitan train system the envy of the other great cities.

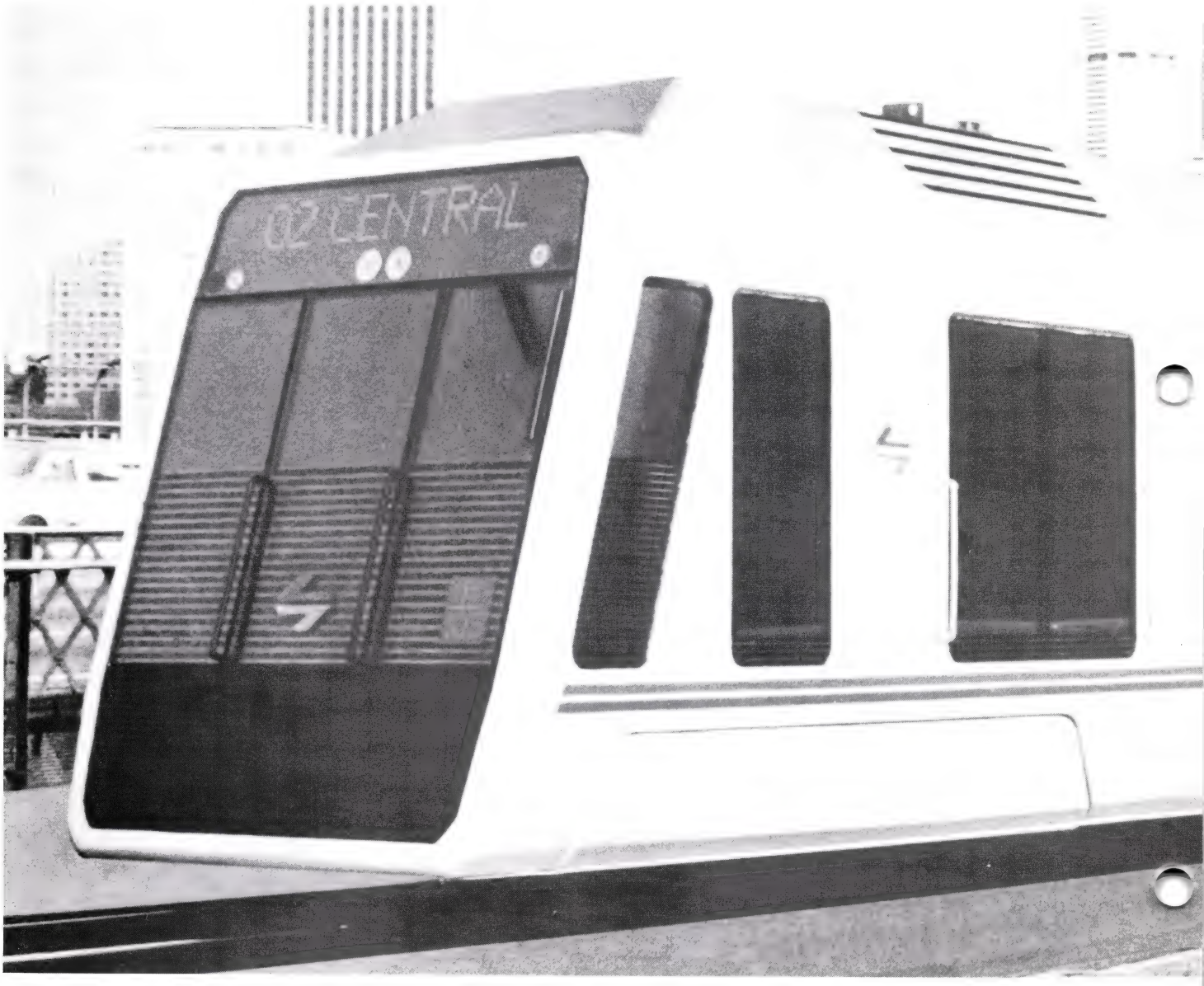
'We are looking for a design that would rank with the best in the world, so the State Rail Authority advertised internationally for companies interested in submitting designs for the new train.

'The Authority received replies from 34 companies from North America, Japan, Western Europe, and Australia and from the preliminary information they supplied chose five to produce detailed submissions.

'The five were asked to produce not only outstanding aesthetic styling for the exterior of the train but also to incorporate the most advanced technology and features for maximum passenger comfort and safety.

'DCA, Design Consultants of Warwick in England, whose transport design unit has produced prototypes for London Transport's 1990 Tube rolling stock and has just won a commission to design the new generation of electric high speed train for British Rail was successful.

'The SRA selection panel, whose decision was ratified by the Authority's Executive and vetted for feasibility and practicality by the heads of the railway's main branches, was made up of eight senior officers from various branches.'



ESIGN UNVEILED

'The other designs submitted were from French, Danish and British companies and a British/Australian consortium.'
The Minister outlined some of the outstanding features of the DCA design:-

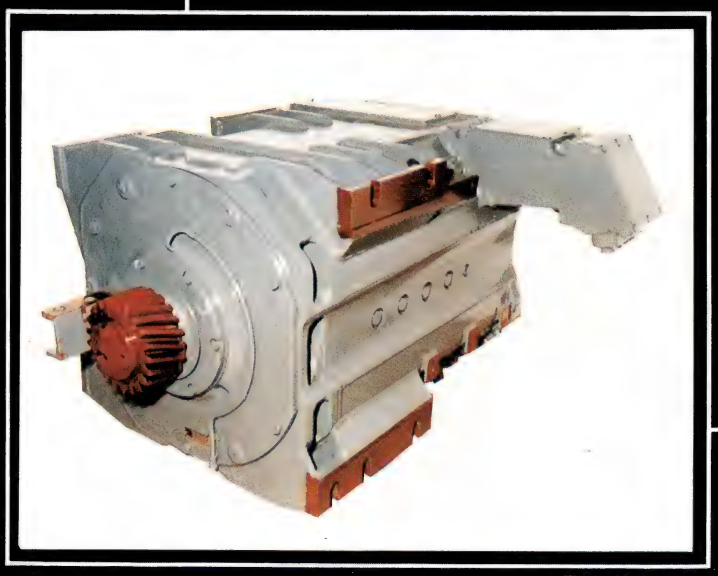
- the visual impact of its sleek exterior with its ultra-modern chisel nose and stainless steel and glass panelling;
- large windows which extend the full height of the twin decks ensuring good visability and a well-lit interior;
- glazed plug doors, made of specially toughened glass, which add to the feeling of spaciousness inside and the visibility while reducing wind noise;
- the specification calls for fully ducted air-conditioning for year-round comfort with provision for emergency ventilation as well;
- a larger vestibule with set back partitions to speed up getting in and out of the carriage;
- vandal-proof automatic doors which can be operated by passengers after the guard unlocks them at each stop to provide a safe, reliable system;
- destination and route indicators on the front and rear of each train and internally, indicators showing destination, route, and stopping pattern;
- internal and external public address systems for passenger information;
- contoured cantilevered seats in the main saloons for ease of cleaning and to provide more leg room and space for luggage;
- video surveillance of all passenger saloons and an emergency communication system in each car to allow passengers to call the guard.

'Other features to give passengers a smoother ride include a blended electric and pneumatic braking system for jerk-free deceleration and semi-fixed couplings between cars, which will also reduce noise,' Mr. Unsworth said.
'Connections between the carriages will be completely enclosed for extra safety and also to cut out track noise.
'The materials for both inside and outside the carriages have been chosen for ease of cleaning and resistance to vandalism while the shape of the new train is aero-dynamically designed to make it energy-efficient.
'Details of the crew compartment have still to be finalised, but equipment will include a computer controlled fault monitoring and recording system to ensure an immediate diagnosis should a fault develop and so reduce train delays caused by a technical malfunction.'
The Minister added that the SRA had already called for tenders for the engineering and construction of the new carriages.
Tenders closed on October 30 and it is expected a contract will be awarded early in 1986.
DCA will be subcontracted to the company building the carriages to ensure the selected styling proposals are incorporated in the finished trains.

USA TURBOTRAIN

CARACAS - Chopper

A COMPLETE



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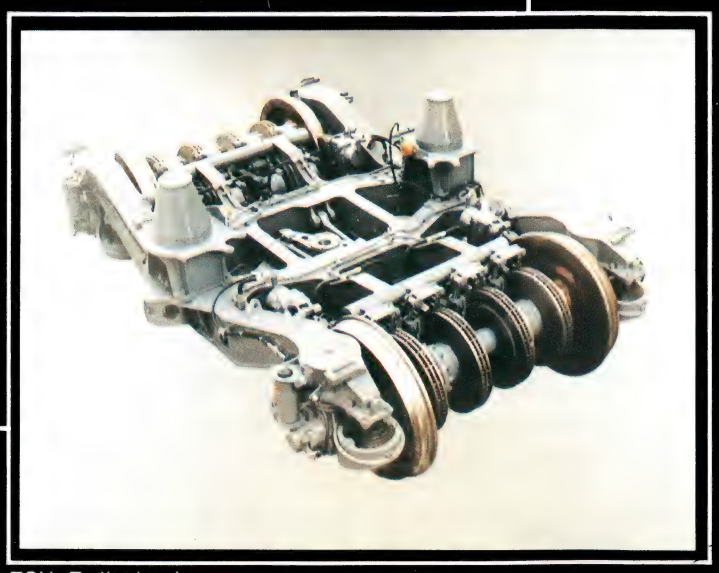
PARIS AREA DOUBLE-DECK

Z2N - Static inverter

POWER LINE



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BIG PUSH FOR V/LINE'S F

'GOING PLACES' — AND HERE'S HOW AND WHERE

During the current financial year, V/Line's rail and road coach services will be marketed strongly through activities initiated and co-ordinated by the Passenger Services Division.

At the end of June, V/Line's Passenger Services Division released its Marketing Plan for 1985-86.

The Plan was based on the results of an extensive market research program and review of the overall objectives and strategies of the organisation.

Within the Plan, the Division will work closely with other rail systems and the Railways of Australia organisation in the promotion of interstate services.

Marketing activities will be oriented towards developing V/Line's services into an attractive, efficient and viable travel system for the people of Victoria consistent with Government policies for transport.

V/Line operations are currently classified as Inter-Urban (services to outer metropolitan areas and nearer country centres), Inter-City (other routes in Victoria) and InterState.

A large proportion of inter-urban travellers is in the range 18 to 24 years of age, mainly travelling to and from work; inter-city and interstate services tend to attract more elderly people, travelling on holidays or visiting friends and relatives.

Surveys show more females than males travel V/Line; more males tend to drive; the proportion of females in the retired age bracket is higher than males; and more females tend to travel for visiting or shopping purposes during working hours.

'Marketing plan based on extensive market research'

The most common reasons given for travelling by country trains were for comfort and convenience; lower cost was another significant reason.

V/Line's share of the total travel market between Melbourne and the major Victorian regions varies, but averages about 7 per cent.

Even modest increases in V/Line's share of the total travel market would significantly lift V/Line's revenue.

V/Line's passenger services objectives for 1985-86 include: a 5 per cent growth in patronage; to operate services based on market demand; to increase revenues (including Government subsidies for fare concessions) to $43.2 million; and progressive integration and co-ordination of all Victorian train and bus services.

Efforts to boost V/Line's travel services will play an important part in achieving these objectives.

Major promotional steps will be taken to position V/Line as a total travel service. This has begun with the opening of V/Line's Travel Centre in Transport House, Melbourne.

Improved information will be made available about services timetables, routes and fares, and there will be developed a comprehensive co-ordinated travel network of rail and road coach services.

Differential pricing structures will be developed; on-train catering services are planned to be increased; and, with country services, such strategies will be adopted as maintaining and developing the holiday market through the provision of packaged tours, and generally broadening V/Line's share of the holiday market.

V/Line will be promoted in country areas as 'the way to travel to Melbourne' for entertainment, personal business or visiting.

Fare initiatives will be used to increase patronage of interstate services, and the marketing of intersystem services — with Railways of Australia — will make a bid to enter such new markets as the international tourist market.

V/Line's passenger services will be promoted through a major corporate promotional campaign and imaginative advertising. This campaign will complement individual product promotions.

In planning its marketing activities for the coming year, the Passenger Services Division has included

... Broadening V/Line's share of the holiday market.

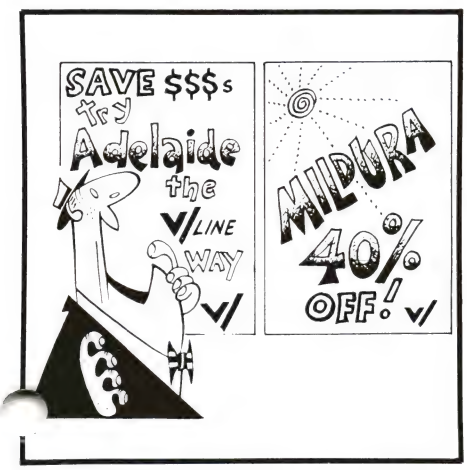
Illustrations by V/Line's Vane Lindesay.

AIL AND ROAD SERVICES

Programs for fare promotions will be designed to increase net revenue by attracting new customers to lower priced services, by distributing loadings between the peak and off-peak services and maximising the revenue from peak services.
Tactics in this strategy will include promotion of Super Saver Fares, making available simplified, easy-to-read timetables, fare guides and product manuals.

V/Line to be promoted as 'the way to travel'

Youth Savers and Sixty Savers; special fares for particular routes, times and events; CAPER fares (advance purchase fares for interstate services); and single tickets for V/Line-MTA combined services.
Marketing devices will be applied to the fares promotion program; for instance it is proposed to introduce selective fare discounts as a means to attract new patronage that, from a good travel experience, would result in repeat business.
Business travel services will be stimulated by a program of high quality service with such ancilliaries as special catering, waiting/departure areas, ticket payment facilities, hire car facilities and communications systems.
Overseas visitors will be catered for in a program involving Railways of Australia's promotion of InterSystem rail travel throughout Australia and overseas, with the production of a modern, professionally produced interstate service brochure and a bid to increase international travel business as a result of ROA overseas marketing.
To encourage use of interstate services in the face of intense competition from other modes of transport, the Marketing Plan proposes overall promotion of interstate service, emphasis on Melbourne-Sydney, Melbourne-Adelaide and Sydney-Albury-Adelaide services, all of which are the subjects of upgrading — including the use of the XPT.
In line with V/Line's total travel concept, the Marketing Plan will have a program of promotion and advertising of its integrated rail and coach network.
Under this heading the Passenger Services Division will specify and monitor standards of service required by travellers — covering key factors such as on-time performance, carriage cleanliness and catering requirements.
Additional to the overall Marketing Plan, which details Statewide programs, regional marketing plans are being prepared.
Local communities will be involved in the planning of regional services by being invited to take part. This will be done by newspaper advertising, direct mailings to interested groups, surveys and group meetings.
Under the Transport Act 1983, the State Transport Authority is responsible for the regulation, co-ordination and integration of all train and non-metropolitan road coach services.
Within this charter the Marketing Plan aims to achieve a modern co-ordinated rail and coach service that enhances effective and efficient travel opportunities for all Victorians. This would result, among other things, from uniform sign posting, livery and information; rationalising of ticketing systems; linking services to enable V/Line to provide point to point travel in competition with the car; and the implementation of co-ordinated services in Ballarat, Bendigo, Geelong and Latrobe Valley.
The Plan envisages promotion of: Special Train services; package tours, restructuring trading and catering facilities and upgrading Spencer Street Station.



... Selective fare discounts to attract new patronage ...

... Travelling by country trains for comfort ...

Standards of service to be closely monitored

EM 120, setting the standard in track recording methods.

Accurate and concise track geometry information is essential to ensure operational safety and wise application of limited track maintenance resources.

The EM 120 measures and records all track geometry parameters at speeds of up to 120 km/hr. Its proven and highly refined measuring system ensures repeatability under widely varying track and climatic conditions.

Its powerful on-board data processing system produces exception, summary and track quality reports in real time, whilst storing all raw data for future reference. A wide range of standard software is available and specialised programs can be prepared if required.

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Cairns-Kuranda Traveltrain. By a special correspondent

With the exception of most of the locals almost every one who has ever set foot in Far North Queensland has at some stage experienced the Cairns-Kuranda Railway.

Over 34 kilometres, this amazing Railway winds its way from sea level to an altitude of over 320 metres. Thirty-four kilometres might not seem like a long way, but when you're climbing mountainsides that are 45⁰ to horizontal, holding your breath while crossing seemingly bottomless gorges, and burrowing through no less than 15 tunnels, there's just enough time left to enjoy the views. And believe me, the views are worth it.

Our QR Traveltrain left Cairns Railway Station and headed north west out of the wide-spread tropical city.

Past the Airport, suburban houses slowly give way to lush fields of waving green sugar-cane.

Although the temperature hovers around the high 30's, the cool breeze filtering through the old wooden carriage makes the journey comfortable.

As the Railway changes direction towards the south-west, the mighty Barron River can be seen for the first time.

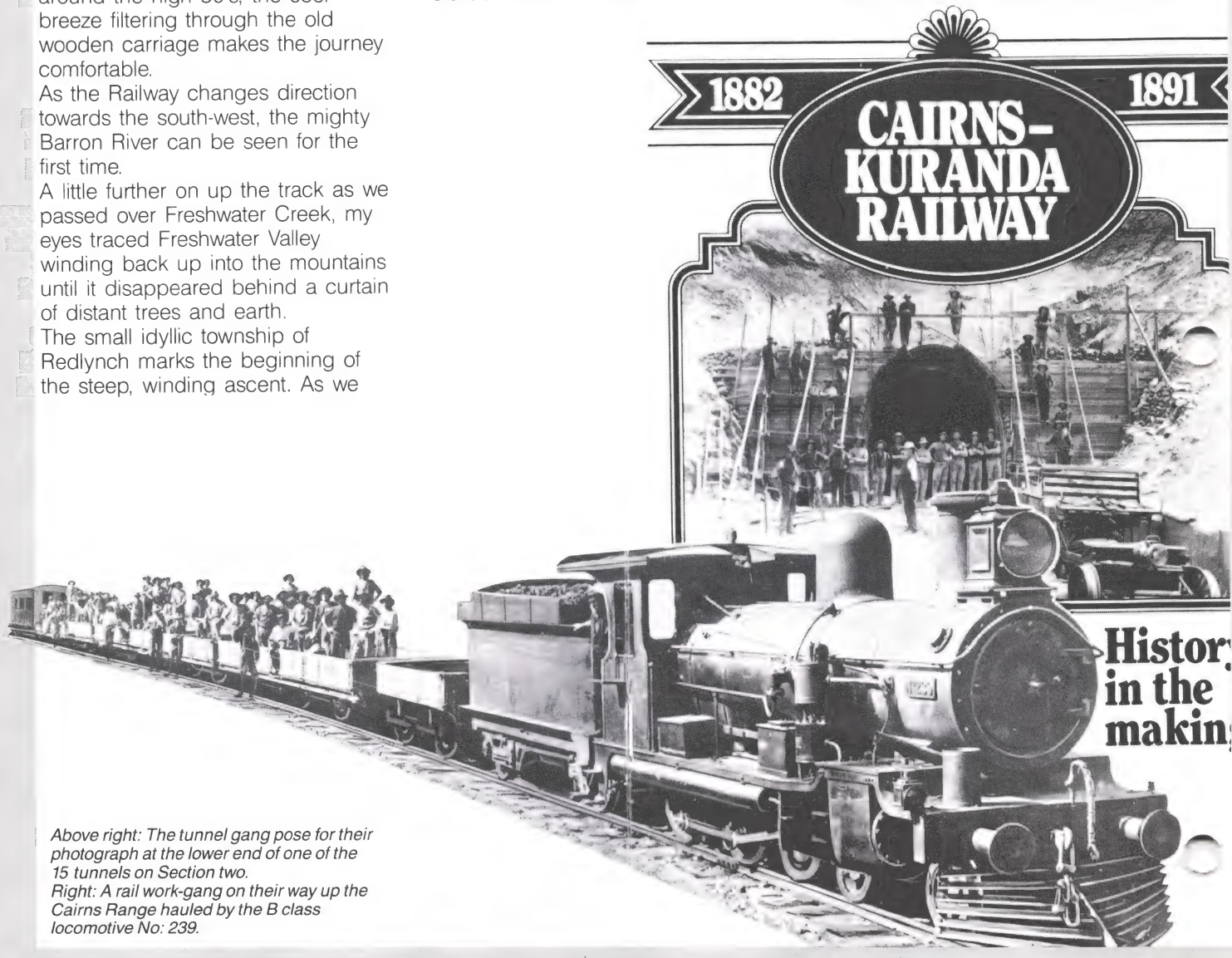
A little further on up the track as we passed over Freshwater Creek, my eyes traced Freshwater Valley winding back up into the mountains until it disappeared behind a curtain of distant trees and earth.

The small idyllic township of Redlynch marks the beginning of the steep, winding ascent. As we climbed higher and higher and each bend afforded more spectacular views, it became apparent why this is often referred to as "God's own country". To any lovers of wilderness, this tropical rainforest must surely rate as one of the world's most beautiful.

As our Traveltrain rounded Horseshoe Bend, almost every camera in the carriage came out of its bag and began clicking, mine included. Canefields appear as a lush green carpet, Mt. Whitfield rises from the Earth like a pre-historic road sign and the crystal waters of the Coral Sea sparkle like a bed of diamonds.

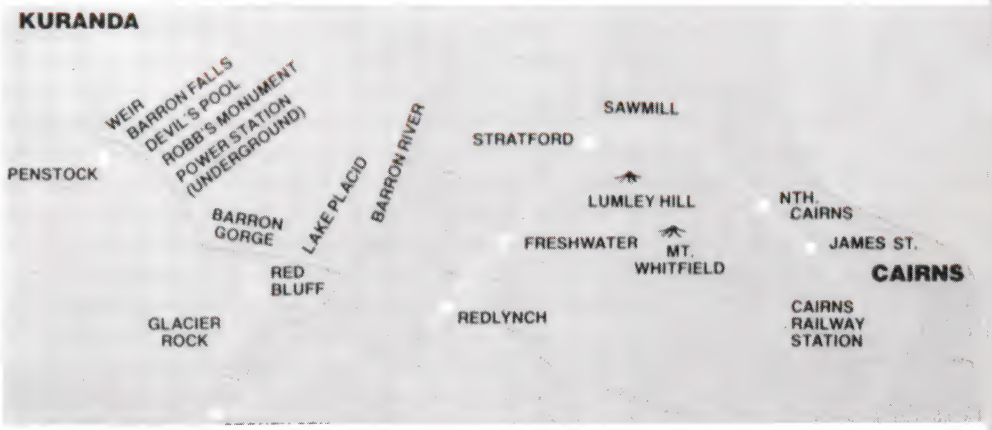
Barron Falls National Park seem to me like the perfect movie set for 'The Land That Time Forgot'. The only word I can use to describe this area is pre-historic — for both the geography and plants. A sight that is forever etched into my memory is Glacier Rock and Red Bluff jutting out from the side of Stoney Creek Gorge like two giant monuments as old as the Earth itself.

The only intermediate stop our Traveltrain made, was at Barron Falls Station. Although the Hydro Electric Plant robs the Barron Falls of most



Above right: The tunnel gang pose for their photograph at the lower end of one of the 15 tunnels on Section two.
Right: A rail work-gang on their way up the Cairns Range hauled by the B class locomotive No: 239.

da Station.



ng little mountain railway'

of its water during the dry seasons, the stop is still worthwhile. And for those of us used to living in cities, the fresh rainforest air is filled with scents that can never be had from a tin. Take a long, deep breath.

The next and final section of our Railway adventure followed the bends of the Barron River to Kuranda Railway Station. The Station is surrounded by dense rainforest with an occasional palm tree sprouting up here and there. Even the Station platforms are decorated with a myriad of pot plants and hanging staghorns that make it appear as much a greenhouse as a Railway Station.

Once in Kuranda, there's no shortage of attractions to visit or ings to do. Orchards, cafes, the Honey House and craft shops are all within the small town of Kuranda. Especially popular are the markets which are set into the rainforest, open every Sunday and Wednesday. As spectacular as this modern day Railway adventure is, its history is every bit as colourful. Like my fellow passengers I received a free booklet which documents the construction of this amazing Railway, between 1882-1891. After travelling the Railway itself and then reading about the extreme difficulties of its construction, my most sincere admiration goes to the workers who built it.

The following passage is a condensed extract from 'Cairns-Kuranda Railway. History in the aking'.

The setting was the prolonged Northern Tropics wet season of 1882. Desperate tin miners on the Wild River near Herberton were unable to obtain supplies and were on the verge of famine. The boggy road leading inland from Port Douglas was proving impossible. As a result, the settlers at Herberton raised loud and angry voices and began agitation for a railway to the coast.

In February 1882, both Port Douglas and Cairns formed Railway Leagues and engaged in a long and bitter fight for the right to the Railway. Not long after Geraldton, later renamed Innisfail, entered the race boasting the sound virtues of Mourilyan Harbour.

In March 1882, Christie Palmerston, an expert bushman and most colourful pioneering character, was commissioned to find a suitable route. During that year he marked several possible routes from the coast inland to the Atherton Tablelands: along the Mossman River, The Barron Valley from Cairns and the Mulgrave Valley.

In March 1884, reports on each route were submitted. This culminated in a decision that is largely responsible for the shape of North Queensland as we know it today. The Barron Valley route was chosen.

Construction of the Cairns-Kuranda Railway was, and still is an engineering feat of tremendous magnitude. It stands not only as testimony to the splended ambitions of the hundreds of men engaged in its construction, but also as a monument to the many men who lost their lives on the amazing project.

The Railway was to be built in three separate sections and on May 10, 1886 work on Section One commenced. Section One ran from Cairns to just beyond Redlynch. Bad luck, sickness and almost unbearable working conditions in swamps and jungles made progress slow and extremely difficult. Only after two successive companies relinquished their contracts, was Section One completed by the Queensland Government.

Section Two, the ascent, was by far the most difficult. It proved extremely arduous and dangerous due to steep grades, dense jungle and hostile natives. The climb rose 1073 feet above sea level, included 15 tunnels, 98 curves and dozens of difficult bridges mounted hundreds of feet above ravines and waterfalls. John Robb and his men tackled the mountains and jungles not with bulldozers, jackhammers and other modern equipment, but with fortitude, hand tools, dynamite, buckets and bare hands.

By May 13, 1891 rail was laid to the end of Section Two. On June 15, 1891 the line was declared open for goods traffic only. Just 10 days later the Cairns-Kuranda Railway line was opened to passenger travel.

Trade at Port Douglas died off rapidly and the town became the quiet little retreat it is today. Geraldton prospered in its own right because of the growing sugar industry. With a reliable supply of goods and freight, the Tablelands bloomed into a wealth of rich grazing land. And Cairns was destined to become the modern, international tourist centre it is today.

Ferns and plants thrive at Kuranda Railway Station in the hot tropical climate.

RADIO CONTROL

The following article is extracted from a paper delivered by Mr Ron Davison to the Australian and New Zealand Railways 1985 Technology/Research Conference, held in Brisbane in August of this year. Almost fifty senior executives and engineers attended the three day meeting hosted by Queensland Railways; of the eight major papers delivered 'NETWORK' has selected Mr. Davison's subject as being of interest to all readers.

By R. Davison

Manager, Signals and Communications, Hamersley Iron Pty. Limited.

Hamersley Iron Pty. Limited owns and operates a standard gauge (1.435m) railway over a distance of 386km from Paraburdoo through Mount Tom Price to Dampier.

The main line is predominantly single track with passing sidings at approximately 20km intervals.

Trains consist of three diesel-electric locomotives hauling 180 to 210 wagons each of 100t nominal capacity.

This results in gross train weights of 21 500 t and 25 000 t respectively.

Wagons are coupled in pairs by a solid drawbar with rotary couplings connecting each pair.

A 210 wagon train is approximately 2km in length and is the heaviest and longest train employing head-end locomotive power operating in the world.

The mainline configuration permits following train movements of 15 minutes separation.

The maximum opposing grade to loaded trains on the Mount Tom Price to Dampier section is 0.33% whilst empty trains returning to the mine negotiate a maximum adverse grade of 2%.

These grades and the gross loads of trains permit an exact balance of locomotive power.

On the Mount Tom Price to Paraburdoo section, there is a constant compensated grade of 0.42% against the loaded trains. Three additional locomotives in 'pusher' service are required for loaded trains for the 100km journey between Paraburdoo and Mount Tom Price to overcome this adverse grade.

Goods trains transport fuel and heavy stores items between the port and mine sites twice a week.

A centralised traffic control (CTC) system utilising motorised switch operations and block signalling is used for control of all mainline traffic from the mine terminals to the 7-Mile Yard complex near Dampier.

Radio communication is maintained with train crews and track maintenance personnel and provides an emergency back-up service for the CTC system.

Train movements from the 7-Mile Yard to the dumpers at Parker Point at East intercourse Island (EII) and within the yard itself, are directed from a control tower adjacent to the workshops and administration buildings at the 7-Mile Yard.

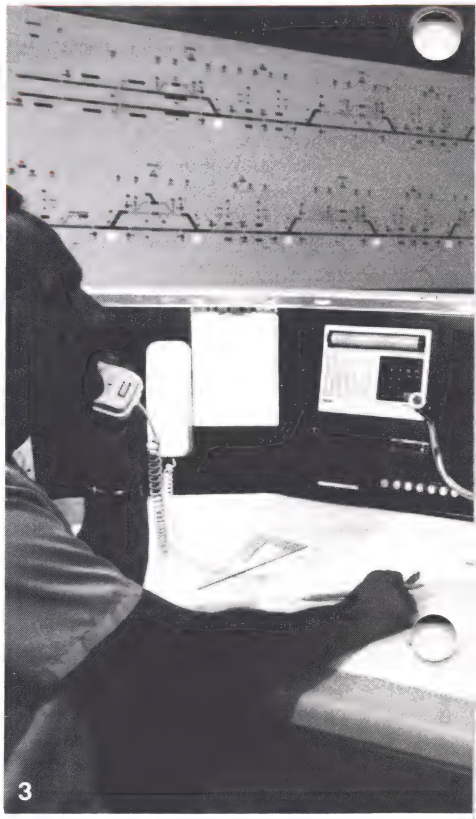
A track maintenance workforce of 180 uses modern, sophisticated heavy-duty mechanised equipment. Their duties are maintenance of track standards for loaded trains, track renewal and repairs.

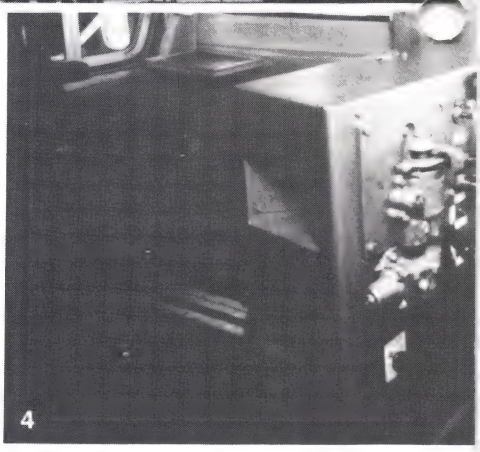
A UHF radio network covers the entire Hamersley Iron operations. Rail's network guarantees 99.98% coverage of the railway lease, it is configured in such a manner that voice communications are available along 92% of the 220kV power line between the Power Station at Dampier and the switching yards at the two mine sites.

A joint venture H.I./Telecom Australia fully duplicated 960 Channel 6.7 GHz micro-wave link provides the backbone of all the communication requirements between the coast and inland mine centres.

General system features:-
Every item of manned rolling-stock, track maintenance plant and support vehicle is fitted with a mobile radio capable of transmitting and receiving on all of Rail's channels. It is an operating rule that personnel operating on, along or adjacent to the main line, have their mobile tuned to Channel 11.

All plant and/or operators have a dedicated radio call sign which must precede any messages. Mobiles are all fitted with automatic identification that is displayed numerically on the Control Console immediately the push to talk button is depressed. The system is in the open configuration, that is, conversations are available to all personnel tuned to that channel. In emergency situations, the control of the radio system can be readily switched from the CTC console at Dampier to either mine site operating centre. Interfaces into the Railway telephone PAX network are available on Channel 12; this interface also exists



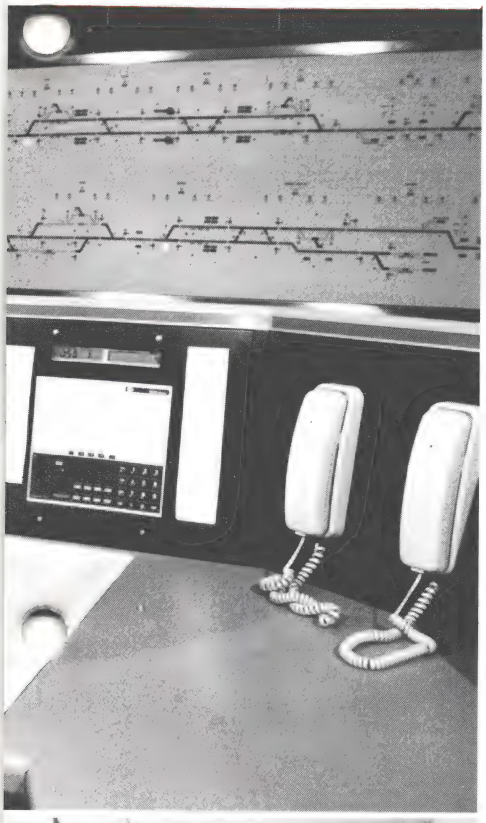


From above in clockwise order:
1. *7 Mile control tower which directs train movements from the 7 Mile Yard to East Intercourse Island and Parker Point rotary car dumpers and within the yard itself.*

2. *Hamersley Iron train passing signals near Dingo Siding approximately 30km from Dampier on the way to Tom Price.*

3. *Centralised Traffic Control (CTC) at 7 Mile. CTC controls all mainline traffic from mine terminals to the 7 Mile.*

4. *Interior of Hamersley Iron loco showing control console and VDU system.*



between the Engineering telephone and the PAX network.

Radio and Engineering telephone systems are continuously recorded on a twin deck, multi-channel tape recorder with automatic time injection.

Dedicated Radio Channels for Rail use are:-

Channel 10 — Reserved for future Emergency use.

Channel 11—Train Control (Main Line).
This channel is controlled from the Centralised Traffic Control Console, the network is configured to enable the duty controller to operate on this channel whilst monitoring any/every other channel at a decreased audio level.

Channel 11 usage is confined to traffic movements, or permission to work on or adjacent to the track, which is all under the direction of the controller.

Channel 12 — General Engineering Channel (Day time controlled by Switchboard personnel).

Channel used by maintenance personnel, power line and general administration. These personnel will usually be tuned to Channel 11 for awareness of operations requirements. When requiring to conduct engineering discussions, for example, they will call the required party by his call sign, when the party responds, they will transfer from Ch.11 to Ch.12 and conduct all business on that channel. In that way, no disruption or distraction is caused to operations. Radios will be returned to Ch.11 following the engineering discussion.

Channel 13 — Track Maintenance Channel.
Permission to work, possession etc,. are via Channel 11, all engineering talk is on Ch13, following similar procedures to Ch12.

Channel 14 — Reserved as future Data channel.

Channel 15 — Simplex. Observer/Techician Channel.

This channel is not repeated so is for line of sight operation only.

All locomotives are equipped with two fixed mobile sets and one hand-held radio. Both mobiles are required to be operational before the locomotive is accepted into traffic as a lead locomotive.

The second set is a standby set and in emergency and/or train difficulty situations is used for local talk. That is, the first set will be tuned to Channel 11 to enable loco to control conversation, second set will be tuned to Channel 15 for driver to observer conversations.

Channel 15 is also used by Signal & Communications and Track personnel for line of sight testing purposes etc.

Channel 16 — Shunt Channel (not repeated, therefore the same frequencies can operate as local channel at the Port, and each mine site).

Dampier, Tom Price, Paraburdoo. Used by the local controller to conduct outside operations.

Channel 17 — Shunt Channel as Ch.16.
Local outside conversations. Shunters, carmen and locomotives for specific area control, e.g., Parker Point Dumper at Dampier, Loadout One at Tom Price etc.

Channel 18 — Shunt Channel as Ch.16.
Local outside conversations but for East Intercourse Island, Loadout Two at Tom Price etc.

Channel 19 — Simplex. (Not repeated). Local line of sight use.

Mainline Operations

As previously mentioned, all movements are normally carried out under signalled conditions, however, in abnormal situations, traffic operates under a caution order system.

The train controller can authorise a train to pass a signal displaying a STOP indication by giving in writing, a caution order. By 'giving in writing', it is meant that the controller will, via the radio system, instruct the locomotive driver (loco number) at such a location (generally a signal number) that owing to an abnormal situation (e.g., signal failure), he is authorised to pass a definite signal number (i.e., Koala 18), in the Stop position and proceed with caution to another fixed signal position. The controller will detail whether or not check calls are to be made at locations between these signal numbers.

If passing through a passing loop, all switch machines will be placed into hand operation and the controller will instruct the driver which machines should be locked into which position, or, if a previous movement on caution orders has already taken place, he will advise that the machines are locked in hand operation in such a position.

If track machinery or gangs are involved, their locations will be clearly identified.

The controller will give his name, time and date and enters it precisely onto ***his*** caution order pad.

The locomotive driver will then read from ***his*** caution order pad the details word by word of the now written order. When completed, the train controller will give a Received by Driver Jones at a time and date. Any differences in numbers, places, names, times and dates will require the process to be recommenced.

The train controller will insert blocking jacks into his mimic diagram in all locations covered by the caution order. He will also make notations on his train running diagram.

On completion of a like given and received caution order instructions, the movement will commence. The caution order is cancelled when the driver advises via the radio system that he is now at the given signal number nominated on the order.

The controller will give a time and date that the order is cancelled. At the journey's completion, the caution orders of both the driver and controller are collected and filed. Special points of interest are:-

- Reason to place all switch machines into hand operation. This disengages the point machine from its motor control. It is a possibility that machines are hand operated into the opposite position to their control circuitry, or that electrical noise is interfering with the non-vital telemetry system. In such instances where the switch track circuit is not shunted and/or signals not being cleared over the switches thereby not locking out their control circuitry, placing into hand operation removes the exposures of the switches replacing themselves after a driver has set them to his route required.

- If machines have already been placed into hand operation and previous orders have been in operation, second caution orders will be given on the move. It is, however, still the driver's responsibility to ensure the switches are set correctly for this given movement.

- Inserting block jacks into his mimic diagram —

(a) reminds the controller that something is being protected out in the field.

(b) prevents unauthorised commands from entering the central processing system.

- In the event of a faulty radio system, caution orders will be given on the wireline telephone system located at every signal location. The very nature of the radio system, i.e., full duplication however, almost always, ensures communications are possible and problems of this type are confined to poor reception at a particular location.

Shunting Caution Orders

Passing loops controlled under the CTC system are not equipped with shunting signals, thereby requiring such moves to be completed under some form of local control.
Such control is given by train controller with the introduction of a special shunting caution order. The form is an extension of the mainline caution order but is confined to a localised area and includes for ***all*** parties involved to participate in the giving and accepting of the order.
The train controller will, via the radio system detail the parameters of the order, just as with the mainline caution order, all the drivers involved in the shunting movement will then repeat the order and be given a time that his acceptance and understanding of the order was made. The last person to repeat the order will be the person who will be responsible for controlling the movement. This can be a driver/observer etc. This shunting caution order is completed when the person in charge reports that the work is completed and all switches are now in the normal and motor positions. The train controller will then cancel the order.

Above: 45km repeater station — one of a network of eight serving the Hamersley Railway.
Top: Hamersley Iron locomotives and loaded ore cars from Tom Price crossing the Fortescue River.
Right: One of the radio repeaters which provide coverage to over 99% of the railway line and adjacent leases.

Track Machine and Hirail Movements

Heavy track machinery and HIRAIL movements are never carried out under controlled signal conditions.

It cannot be guaranteed that this type of vehicle will shunt track circuits at all times or that short, light and fast vehicles will operate or release different track circuits in correct sequence, thereby

introducing time out situations unnecessarily. These movements are therefore, controlled via radio communications coupled with blocking jack protection and notation on the train controller's running diagram.

It is not intended in this paper to detail the blocking jack protection system incorporated in the H.I. CTC system. Basically, it comprises:-

- On loop departure signals and switch machines. Blocking jacks will prevent control commands from entering the central processing system. It is not a vital system and is totally central office orientated.
- At the double intermediate locations, control is separate to each section each side of the mid-point signals. It is a double tiered system that -

(a) allows protection for a following train/machine situation whilst leaving the departure from the blocked section clear for the ore train, but will afterwards protect the obstruction from any further moves.

(b) allows movements from two passing loops out into the single line section in opposing direction under certain control circumstances.

This double intermediate system involves vital interlocking in the field but still relies on the nonvital telemetry parity and polynomial checking to provision some degree of second line protection.

Track Machinery and HIRAIL operators are required to hold a Certificate of Competency on the H.I. Operating Rules and an Authority to Drive Certificate. Both these certificates involve passing a written and practical examination.

The driver of such a vehicle will advise control of who, what his location and his desire to on-track at that location, detailing his intended destination. The controller will either allow him on track or advise him to stay clear and give the reason why.

If allowing him on track, he will give him permission to move to the next controlled signal but detail the numbers of the double intermediate signals he may pass irrespective of the aspects displayed. The driver will repeat the controller's message exactly finishing with his call sign.

The controller will install blocking jacks in the precise location/s and note on his train running diagram just as if it were a train, but using a different colour.

On arrival at the next controlled signal, the vehicle driver will call control identifying himself and also his location.

The controller will repeat the message. The driver will request to proceed past that fixed signal, detailing the number and proceed to the next passing loop's arrival signal.

The controller will confirm (or deny) his permission to proceed but will also detail which track and past which departure signal and also the numbers of the double intermediate signals. The driver will repeat the message exactly prior to moving on.

Train control will also move the blocking jacks forward into the now occupied sections. This procedure is followed until the journey's end or until an instruction to off-track is given.

Track Machine or Gang Working Protection

Track machines or gangs wishing to break and/or work foul of the track will seek permission of the train controller.

They will call control advising who they are and their location. When acknowledged, they will detail what

they want to do, where they will do it and its effect to control in a time dimension. Control will reject or give permission by repeating their message giving a precise time for job completion and/or a check call. The gang once again repeat the permission to work message. He will then request protection from the office. The controller if accepting this, will insert blocking jacks in his mimic diagram to prevent signals being cleared into the affected area and/or prevent signals being cleared into the movement of switches. He will also draw in the obstruction on his train running diagram, again using a different colour.

The obstruction is in effect until the track machine or gang advises all is clear and safe for train working following the same procedures as when the protection was implemented.

If problems occur with radio clarity or information is falsely or incorrectly repeated more than once, the machine/gang will be told to remain clear. They will acknowledge that they have to stay clear, failing this, a check will be made prior to another move taking place over that location.

Yard Operations

None of Hamersley's yards are fully track circuited at this present time. (Capital is sought this financial year to complete this work). Trailable switch machines with overlay track circuits are installed to the majority of the networks. It is not an operating practice to trail through these installations.

Yard operations therefore, are totally conducted via radio control. Shunters will contact the Yard Controllers and detail the movements required and the Controller will set up the yard accordingly, advising the shunter of the set up now in place. Again all messages are repeated prior to any movements, taking place (that is of traffic or switches being made).

System Efficiency

From the above, it can be seen that it is necessary to have:-

- a strong desire to ensure the system remains operationally efficient (safety is a sub-system to an efficient operation).
- a set of rules in place that are simple yet adequate and practical.
- a disciplined communication procedure.
- a communication system that gives adequate coverage of all facets of the operation.
- a reliable communications system with adequate duplication or backup network.

Conclusion

If the preceding steps are in place, safe working over a radio system is not only viable, it is safe and practical. It has to be recognised that the human element is more involved and therefore there is an increased exposure to that human error, but, we all have in the main, a dedicated and loyal workforce which has the railroad's welfare and safe working in the forefront of their minds.

To those who have not got CTC systems installed, progress has been made in block working over a radio link. It is the writer's belief that with the advent of processor controlled mobiles, this method of working can be further protected against human error and should be vigorously explored as a lesser alternative to a total signal installation.

Hamersley's railroad system is efficient; our $/tonne figure is extremely low when compared to any networks; our safety record is enviable and we intend to stay that way. Our radio system forms a major part of these achievements.

Hamersley Iron Hi-Rail four wheel drive service vehicle approaching Pelican Siding. Hi-Rail vehicles are used by maintenance and supervisory staff for on-off track inspections.

New ROAC Assistant Director

Mr Max Michell, 44, has been appointed Assistant Director (Intersystem Traffic Control) of the Railways of Australia Committee and formally took up his duties on September 30 1985.

He succeeds Mr S.'Siggi' Johr who has retired from the position.

Prior to his appointment Mr Michell was Manager, Operations Research and Planning, for V/Line. His recent experience includes operational and planning appointments as well as secondments to the finance function and Ministry of Transport.

His qualifications include Bachelor of Business (Transport Economics) and Certificate of Transport Administration from the Royal Melbourne Institute of Technology.

He is a member of the Chartered Institute of Transport and is on the Transport Degree Advisory Committee at RMIT.

The retiring Assistant Director, Mr. S. 'Siggi' Johr came to Australia in December 1951 with the avowed intention of staying about two years in a new and interesting land.

As he modestly says thirty four years later 'I fell in love with Australia and its people' — a feeling which has not diminished.

Mr S. "Siggi" Johr (left) welcomes his successor, Mr Max Michell, to the position of Assistant Director (Intersystem Traffic Control) of the Railways of Australia Committee.

He became Assistant Director (ITC) in November 1982, joining ROA on secondment from Australian National where he was assistant Operations Manager (South).

The vigorous CENWAG operation which Max Michell takes over is a fine tribute to the dedication, enthusiasm and knowledge of the previous occupants of the position — 'Siggi' Johr, and the founding 'father', Jim Kennedy.

Staff in all Systems will wish 'Siggi' Johr every success on his retirement.

Minister announces new AN postings

The Federal Minister for Transport, Mr Peter Morris, recently announced appointments to the Commission of Australian National (AN).

Joining AN will be Mr Peter Murray, who has recently retired as General Manager — Mining of R W Miller and Co Pty Ltd.

'His expertise in business and experience as a consumer of transport services should make a major contribution to AN's drive for greater commercial viability,' Mr Morris said.

'AN's General Manager, Dr Don Williams, has also been appointed to the Commission. Dr Williams has a long history of involvement in the rail industry and, since AN's Chairman, Mr Lou Marks, became part-time, has been the Chief Executive of AN.

'I am also pleased to announced the re-appointment of Dr Derek Scrafton, South Australian Director-General of Transport and Mr Charles Clements, Chairman and Managing Director of Clements Marshall Consolidated Ltd of Devonport, Tasmania.'

Mr Morris also paid tribute to retiring Commissioners, Dr Harold Bell of Sydney and Mr David Fowler of Adelaide for their contribution to AN.

Over the past two years, AN has achieved a major improvement on its financial performance.

That achievement is something the Commission, AN's management and all its workforce can be justly proud of,' Mr Morris concluded.

METROS THAT MOVE

By Chris Bushell

It is an astonishing fact that new rail rapid transit or metro systems are opening at an average of about two a year, with this figure likely to be maintained until the end of the decade.

Few of the world's major conurbations have rejected the generally accepted view that a rail transit system is the only really satisfactory means of moving millions of daily commuters.

Most large cities not already blessed with such a network, or in the process of building one, are firmly wedded to the idea but waiting on circumstances.

Even in countries where there is little or nothing in the way of a national rail passenger system — for example, Venezuela and Brazil — the authorities have no doubts about the value of investment in their city railways.

High Capacity Rail Corridors

The development of metros in heavily populated cities has been most marked since the mid-1950's, coinciding at least in part with the development of mass private car ownership and recognition of the adverse effects of car and bus commuting on the urban environment.

No city is likely to be able to do without a bus network, but the trend is firmly towards the use of buses as low density feeders to high capacity rail corridors running into the heart of the business and commercial district.

Until recently, this was largely a western phenomenon, but the rapid population growth of cities in the Middle and Far East, and in South America, has led to a shift of emphasis.

Now there are metros in teeming cities like Calcutta, Hong Kong, Caracas and Mexico City, making life a little easier for people whose commuting by road was often nightmarish.

Daily travel by the inhabitants of these busy cities produces some amazing statistics. Mexico City's metro carries nearly four million people a day, and still accounts for only about one-third of all journeys.

Rail systems capable of moving large numbers — up to 60,000 passengers an hour in each direction — are extremely costly to construct and equip, and so are suitable only for cities with the most substantial traffic flows. Fortunately, the flexibility of rail transit produces variants capable of coping efficiently and economically with flows of about 2000 an hour upwards.

The Modern Tramway

At the lower end of the scale is light rail transit (LRT), and such modern tramway systems often incorporate tunnels through congested city centre areas and use a mixture of on-street and reserved track elsewhere. Capital costs are much less than for a metro, because the infrastructure standards are less severe and the cars are smaller and lighter.

There has been a rapid growth in such systems over the past ten years, as many cities modernise their existing tramways for a new role, and others choose the low cost rail solution to their road traffic problems. Thoroughly familiar to visitors to West German cities, LRT networks have spread to the United States of America, North Africa and the Far East.

Another recent phenomenon is the upgraded suburban railway, known as commuter rail. Displaying many of the characteristics of a metro, commuter rail systems use the routes of existing, often moribund, suburban railways to provide fast access to city centres. Electrification, together with new trains and stations, turns disused track into high capacity traffic arteries, again at less cost than constructing a metro from scratch.

As yet there is no metro operating in a Middle East city, but this should be rectified by the end of 1987, when the first line of the Baghdad metro is expected to open for traffic.

Looking At Plans

Other cities in the region — Kuwait, Jeddah and Riyadh among them — are looking at plans for metro or light rail networks. Cairo has under construction a combined metro and upgraded suburban rail network, and its two tramway systems are being modernised. Algiers is building a metro and expanding its

Faster travel for Hong Kong commuters

A 3.5 billion HK dollar modernisation of the Kowloon-Canton Railway (KCR) has brought swift and smooth travel for increasing numbers of Hong Kong commuters.

Designed in Britain, the six-car train pictured is one of a completely new fleet of electric multiple units (EMUs) built by Metro-Cammell which, compared with the previous diesels, halve travelling time and transform standards of passenger comfort to those of the world's best surburban services.

Sixty-one three-car sets are being supplied, all fully air-conditioned with driving cabs at either end.

Forty-one sets for the outer suburban service have first class compartments and shorten the 34 kilometre journey time between Kowloon and Lo Wu on the Chinese border from 70 minutes to 36 minutes.

The 20 inner suburban sets running between Kowloon and Sha Tin are designed to carry more passengers — 256 seated and 589 standing.

Fast access is given by three powered sliding doors on either side of each car.

All passenger services on the railway, with the exception of the through train diesel powered service to Canton (Guangzhou), are operated by EMUs which carried over 47 million people in 1984. It is estimated that use of the railway wil grow to 500,000 a day by the early 1990s.

The five year KCR modernisation represents one of the latest chapters in British railway technology. The original planning was carried out by Transmark, the British Rail consultancy who also acted as project managers.

MILLIONS EVERY DAY

suburban railways, while Tunis has just opened the first stage of its 32 km light rail network, which will supplement the existing Tunis-La Marsa suburban operation. But, with several heavily populated cities still lacking an urban rail infrastructure, the region clearly is set for further growth in mass transit.

In Baghdad, the consultancy contract is one of the largest ever awarded for a metro project. It was won by a British consortium, the British Metro Consultants Group (BMCG). This consultancy is independent of manufacturing interests, and its members are well known for their work in all aspects of metro design. British experience in metros is wide ranging, as befits the country that gave the world its first metropolitan railway as long ago as 1863. London Regional Transport's consultancy arm, London Transport International, and the British Rail consulting subsidiary Transmark, are both associated with the BMCG for the Baghdad metro project.

Other consulting group, British Mass Transit Consultants, is improving consultancy services for the Taipei metro project, with the first stage due to open in 1990.

Other groupings, such as MetroTec, have been formed by manufacturers to offer a single point of access for all the facilities and technology required for a modern urban rail network. These manufacturers act together or separately.

Project Manager

GEC Transportation Projects, for example, was the main supplier of the cars, depot equipment and some of the track for Lines 3 and 4 of the Seoul metro, which is due to open shortly. In addition, GEC TP International was the overall project manager for this task of building 57km of metro in little more than five years. Again, equipment manufactured by GEC Traction powers the metro cars of many cities, while another GEC company, GEC Transmission & Distribution Projects, is a leader in the provision of traction power supply equipment. Rolling stock builder Metro-Cammel, another MetroTec member, scored a major success in its long history of metro car construction by winning the contract for Hong Kong's Mass Transit Railway (MTR) trains. On completion of the contract in 1984, a total of 576 cars had been supplied, along with a further 183 cars for Hong Kong's other railway. This is the Kowloon-Canton Railway (KCR), which has been upgraded and electrified to form a fine example of a commuter rail system.

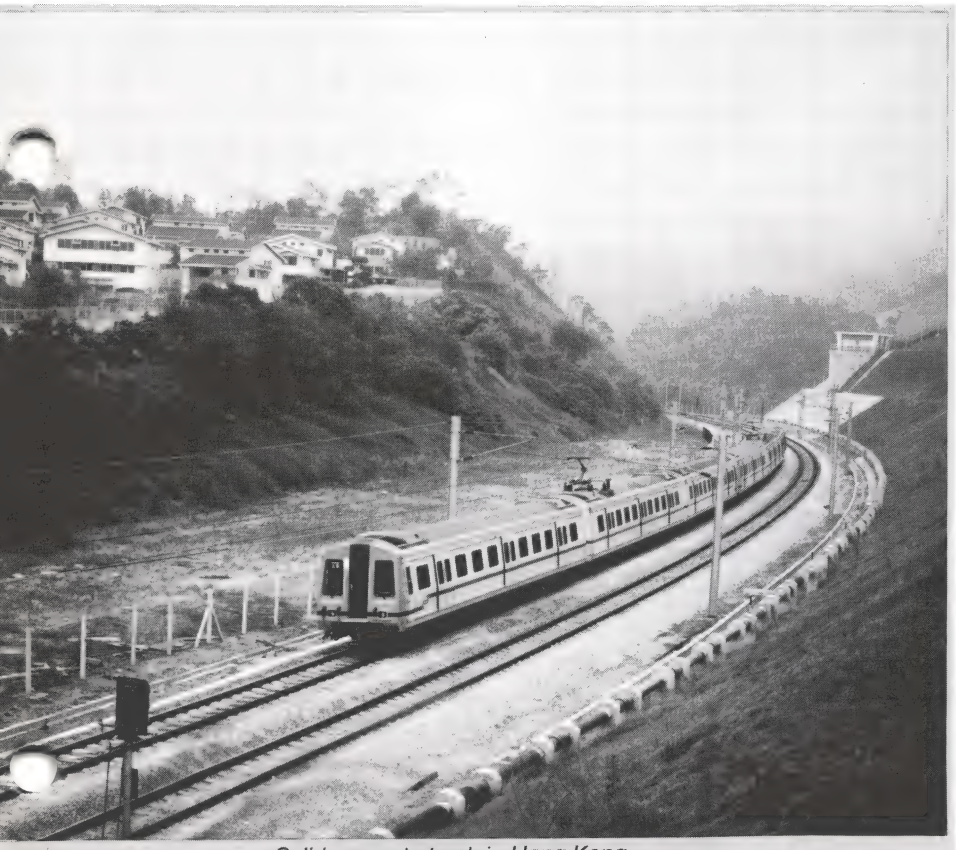
The design and construction of cars for operation in the sub-tropical environment of Hong Kong posed special problems. With ambient conditions rising to +33ºC and 75% humidity, air conditioning was essential. Stone International supplied the equipment for the MTR trains, and Temperature Ltd that for the KCR stock.

The two huge Hong Kong rail projects are an excellent example of British metro technology, for British manufacturers played a major role in equipping both the MTR and the KCR. Apart from the trains, track for both systems was supplied by Henry Boot.

Ideal for Automation

Rail systems are ideal candidates for automation. London's Victoria line is Britain's only example of a fully automated railway, in which the driver's role is reduced to little more than merely being present in the cab at the front of the train. As operating costs continue to rise, the next logical step is to do without the 'driver' and run trains completely automatically, as in Lille and on one or two systems in Japan. London's new Docklands light railway, now under construction, will have driverless — though not unmanned — trains when it opens in 1987. Engineering, construction, mechanical and electrical work on this project is a joint venture of GEC Transportation Projects and John Mowlem.

Thorn EMI is just starting delivery of equipment under a L25 million contract for nearly 3000 machines for British Rail booking offices and ticket staff. Control Systems Ltd has supplied ticket machines for suburban stations in New York, while Automatic Revenue Controls equipped the Glasgow metro in Scotland.



Solid concrete track in Hong Kong.

A railway ma

By a special correspondent

Ten years ago the Indonesian State Railways (PJKA) was in a most unfortunate situation.
Many aspects of the railway suffered from deterioration. The condition of trains was causing concern and the track was a major problem.
All over the PJKA system, the late-arriving traveller was confronted by rusting rows of obsolete rolling stock, most of it dating from the 1920's and some going as far back as 1880.
Clean but antique steam engines wheezed and clanked along; the railway's diesels were saddled with chronic spare parts problems and declining serviceability.
Nobody could contemplate a realistic plan for determining the railway's role, and doing the things that a compact 1067mm gauge railway on two crowded tropical islands could still do well, despite short hauls and unfettered road competition.
Today, PJKA is a totally different railway — by no means a new one, for there has been relatively little investment in PJKA compared with overall need.

But at least the railway looks good, and is getting better.
There is some new track, and still some very poor track, even on secondary main lines — one of them carrying 36 trains daily, 28 being passenger trains.
But the rusting lines of rolling stock have been junked.
If the grass grows high over disused sidings made redundant by the truck's capturing the short-haul wagonload traffic for which previous generations bought the wrong kind of car, at least the siding is concealed.
The 1500Vdc catenary may still be strung over the grass — but the eyesore is no longer there.
The masts have been repainted. The system looks smart.
The ballast has been repacked and the trains run on time over the often-battered old rails. There are more trains too, and today some of them are good trains by anyone's standards.
The PJKA trains that make money today are known, for PJKA runs as a business. It has its plan, it knows its problems and it has clear-cut business objectives that all are working to achieve.

The last of PJKA's steam hauled expresses w Surabaya in 1973.

All this of course results from a team effort and a great deal of hard work. But every team needs a leader, and PJKA has a leader in there to win. His job is Director-General. His name is Mr Soedjono, his background is

A "Cepat" (express) passenger train between Bandung and Jogjakarta — hauled by a BB class diesel hydraulic.

nager's diary

Doho — seen here south of

totally non-railway, and his railway achievements are based largely on his all-consuming interest in three ...jects: management, management a...d management.

And if the general smartening up of Mr Soedjono's railway smacks strongly of being a textbook example of the things they teach in the better management schools, fair enough. For on PJKA the Director-General was empowered by President Suharto to sort the railway out. He wrote all the new railway textbooks and probably some of those in the management school as well. And not only the textbook itself, but the philosophy underlying his management revolution (which had to reflect Indonesian culture), the lecture notes for senior staff, and the personal diary that every Indonesia railway officer must today carry, use and keep up-to-date.

...a remarkable document, this ...iary — in fact probably the only diary expressly designed by the head of the railway for use by his own officers. It is quite subtly constructed to remind people exactly what they now are supposed to be out and doing. Mr. Soedjono's diary is, in fact, the prototype for a project that other railways could usefully contemplate, for between its well-bound blue leatherette covers there should repose about 75 percent of the basic information — much of it self-generated — needed by a railway officer to manage, and the tools that orient him towards setting objectives and managing better.

So let's open this diary. Its cover carries the gold-embossed railway crest and the word 'Agenda' — Bahasa for Diary, but in truth a real agenda in the sense that an agenda is a documentary reminder.

On page 1 is the Pancasila, the five principles of coexistence embodied in the Constitution and national philosophy of the Republic that owns the railway. Page 3 reminds the diarist of the specific obligations of every Indonesian public servant to serve his country and his people honestly and well, and on the next page there is the 1980 charter of the railway. Page 5 sets out the goals that all railwaymen should achieve in general terms — safety, service, rules and so on.

The next two pages list last year's calendar (headed by a steam engine) and the current year (with a diesel). Page 6 lists National Holidays and page 7 National days of commemoration — 28 September being Railway Day, and something of a family celebration on PJKA. Page 9 is for the diary owner to list his personal details so that the finder can contact him and return it if lost, and page 11 is a tear-out slip for the diarist to acknowledge having receipt.

Shades of the Weekly Notice!

The next 24 pages list all key officials by name, home and office address, PTT and Railway phone number, and every key railway installation (including the street address of the station in important cities). The people listed are on 24-hour call and this means exactly what it implies — the phone is to be manned, and the officer is to be traceable. Five more pages provide for the diarist to enter his own contacts. A few conversion units follow, then 12 monthly pages for major appointments, and another 12 for making notes thereon.

So far there is little that is remarkable. But not thereafter, for the structure of the diary then moves right into Director-General's management philosophy — targets and performance. The next section comprises 20 double-spread pages in which the individual manager is required to enter each specific unit of system performance for which he as a manager is responsible — for example, passenger train revenue, % on-time arrival, cement wagon forwardings, wheel sets reprofiled. These are breakouts of district targets, circulated by memorandum.

For each of these performance criteria the office then bar-charts on a weekly basis through the year (April/March on PJKA) the target level he has been set and progressively, the actual output that his operation has achieved. In other words from foreman or stationmaster upwards, today's manager on PJKA is required to think, operate and manage in quantitative terms, to set objectives, and to achieve them. His diary is his Bible, his constant companion, and his reminder of what he is supposed to be about.

Other tabular pages follow to summarise, in quantitative terms, the diarist's responsibilities by statistical indicators appropriate to the PJKA Branch in which he or she works. Traffic people will note the passengers, tonne-km and revenues to be achieved; track people the track maintenance tasks to be done — re-railing, resleepering, resurfacing, repacking, and resources used; signal people the block equipments or interlockings to be inspected; telecom people the equipment to be repaired or replaced, and so on. The diary provides the system totals for

(continued on page 53)

Bookshelf

"Janes' Urban Transport Systems 1985 — Fourth Edition."

210 x 320 mm, 571 pp, several hundred half-tone illustrations, hard cloth covers.

Published by Janes', 238 City Road, London EC1V, 2PU, England. UK price 51 Pounds, probably around $100 locally.

The fourth edition of Janes' Urban Transport continues its run of improvement, particularly on the Australian scene.

In reviewing previous editions, 'Network' has commented on the lack of facts surrounding Australian Urban Systems, and those manufacturers which serve it. Perhaps our comments have done some good work — there is further detail in this issue.

And with the advent of the Australian Railway Industry Council, perhaps that body will encourage manufacturers to take "Janes" opportunity of telling prospective customers in neighbouring countries just what we can offer.

This year, consultants and signal manufacturers join the ranks of those who are putting their services forward. And the information of Melbourne's urban transport service is right up to date with the task of their Metropolitan Transit Authority clearly spelt out.

Naturally, one judges the worth of any work by that section of it known to the reviewer. One would assume, therefore, that the facts relating to Urban Transport Systems in other parts of the world are as accurate as those relating to Australia.

And visually it is a truly fascinating volume. The illustrations cover a wide range of vehicles from elderly unrebuilt trolleybuses to modern standard tram cars; there are suburban rail units of infinite variety from manufacturing sources all over the world.

Just to browse through the volume cannot fail to raise reader interest.

But of course, the price is still steep — and your reviewer suggests that Janes' Urban Transport Systems will appear largely on the shelves of Institutional libraries, rather than those of the individual.

As a point of reference with wide ranging information on how the world's cities respond to very difficult tasks, Janes' is good reading.

(continued from page 51)

most important of these things by region. The sub-targets for Mechanical Branch people are particularly specific, set out on a monthly basis by prescribed task. All officers are further required to run a percentage plot of budget versus actual rupiah expenditure, and to record staff establishment versus strength.

To assist the manager to manage, and use his diary, there is a wealth of useful reference information. Motor cars in Indonesia have city-specific number plates; the diary therefore gives a list of motor vehicle license-plate prefixes, eg AD for Surakarta and BG for Palembang, useful for identifying a parked vehicle as belonging to a particular visitor, or ing an unfamiliar (suspicious?) vehicle in an area where things are wont to disappear. A list of international codes is provided to identify a car that is foreign. Key traffic regulations in foreign countries are also summarised by table — eg speed limits, seat belts — for increasingly, the PJKA officer is being sent overseas. There is an international time map and a list of national ISD codes to assist his efficient use of the telephone — on the old PJKA telecom network it was often impossible to get a line — let along a number in the next city! Not so today — investment in high-quality communications was one of Mr Soedjono's top priorities. The phones work well and once into the PJKA system, communication is very od.

Typical PJKA wagons, including an unusual bogie open with sliding half-roofs. Most, however, are 4-wheeled and uncompetitive in size and speed with trucks for classic wagonload service.

Engineers, too, are helped by useful bar-charts for scaling quick 'orientational' conversions (including the messier units like Kilocalories or British thermal units directly to kilojoules of work) and there are eight pages of tabulated, 'one-stop' conversion factors for making accurate engineering calculations (which makes this a very useful diary for any engineer, railway or otherwise). Six pages list by code, description (and in the case of locos, running number blocks) all of the modern rolling stock on the railway. Fully one half of this diary — in fact, the next 200 pages — is given over to recording meetings and discussions as they occur in chronological order, without running out of space or wasting it because of single-day pages or half-pages. There are 16 pages of graph-paper, four gate-folded colour maps of the system (with station codes, interstation distances and section length given in every case) and a table of the major line-haul lengths to save totting up figures of the map. Next year's calendar rounds off the book.

PJKA is now run to the M dictum: marketing-money-men-motivation-material-modern communications-management-management information-mobilisation-

(continued next page)

Two 2000 hp GE diesels heading a combined express through the electrified Jakarta suburban area. First-line equipment is kept very clean nowadays.

Driver's-eye view of a mountain viaduct on the scenic Jakarta-Bandung line. Just 2.5m wide — and 90m high!

mechanisation, as developed along the American business management lines in which Mr Soedjono was professionally trained.

Pressed by Network, Mr Soedjono revealed an interesting sidelight — he used English to think these concepts through in railway terms, but he was able to find a matching and appropriate word in Bahasa for each of his M's! All PJKA managers are being trained to think, operate and report in these terms, and to plan within a corporate planning cycle that is built around them (although fundamentally not all that different from those methods found on (say) Westrail or V/Line). The differences are essentially system-specific and cultural (for there are some uniquely Javanese philosophies built into PJKA's ways of doing things). But the thrust is the same.

Although not a railwayman by training Mr Soedjono's long background in the ports and shipping industry made him a highly experienced transport operator, with the 'intermodal' outlook that the previously traditionlist PJKA lacked. When he moved into the Director General's Office — rather like a large living room in the front bay-windows of the bungalow style PJKA Headquarters complex in Bandung — the new Director General listened, learned and asked questions for six months before taking any real initiatives of his own. When asked how long it had taken for the railway people to accept him and talk freely, he answered with a twinkle in his eye 'six months'.

Then the whirlwind struck, from a high-powered business-trained executive who works a regular 14-hour day five days a week, and seven hours on the sixth. Friday (the Muslim sabbath) is a day off.

Senior executives were in effect given twelve months to learn new ways of doing things, to retire, or to be side-tracked. Most learned the new skills. To replace those who could not, a new breed of 30-35 years old people has been selected or hired, and after initial training thrown into the Districts with positions of line management responsibility and directives to learn and perform. They have 3-5 years to do this, after which they will be either promoted or fired. They are all engineering or science-trained, and those who had not done the course beforehand were sent back to the Bandung University School of Management for postgraduate business studies. This railway is a transport business, period. And it is

PJKA inherited hundreds of km of very poor track from its predecessor administration, and the permanent way still remains Mr Soedjono's greatest problem. Surabaja — Bandung section, where this representative photo was taken, carries 36 trains daily — 28 of them passenger trains.

not hard to pick a Soedjono man when you visit the PJKA districts. The people being developed as the next generation PJKA and Australian railway leaders are interchangeable, and either would do well in either environment.

In practical terms PJKA already operates first and foremost to achieve marketing goals, substantially under 'business sector' management principles. The railway has a corporate planning system in place now, and a management information system whose impact is spreading wider and biting deeper as the new computers are introduced, and the new railway telecommunications network stretches across Java and Sumatra.

The railway is a short-haul system whose future lies in intercity passengers and bulk materials — mostly coal. Cement (currently bagged) is also to go in bulk. The steam engines have gone and the system is today wholly dieselised (the 1928 Jakarta suburban electrification has been rehabilitated and is the foundation of JABOTABEK, a $US1200m rebuilding and expansion programme for a regional express railway). Containers? Well — maybe, and tempting to a ports and shipping man, but Java's traffics make the main island ideal trucking country. There is not much import/export container traffic, and the clients realise it. PJKA is unlikely to go RACE with its relatively short hauls. Nor is it to remain in the LCL or parcels business.

PJKA still has an appalling legacy to overcome in deteriorated track, which is being put into the best possible fettle by grass-roots repair efforts. Often this 'best possible' is in fact only fair.

But relaying in continuous-welded 42kg rail on concrete sleepers is proceeding on the busier lines as a top-priority task, with coal routes having priority and key inter-city passenger links closely following. The wagon fleet suffers from a surplus of postwar steel 4-wheel box vans, largely irrelevant to today's transport track materials.

The coaching stock today comprises postwar all-steel cars along — at 23 by 3 metres they are very long and wide for the 1067 mm gauge. The diesel loco fleet is a mixture of new General Electric Co-Co diesel electrics and Krupp B-B diesel-hydraulics, with some older General Motors-EMD Co-Co with the rather antique Alco 244 engine. Workshops are being rehabilitated, and bridges put into order. There is the genesis of a local railway industry. Everything works, and generally, stays on the rails. Which for those who have seen some of Mr Soedjono's track is of itself something of an achievement.

The system has other problems arising from its mixed State and company railway origins during the Dutch colonial era. On Java (the most populous island, and except for Sumatran coal the most important of the four PJKA networks) the railway has two complete sets of different engineering standards, of which only the gauge is common. The ex-State railways have 16t axle loads; they were well built — indeed superbly engineered in the mountains. The ex-Company lines have generally 12t with some 10t axle loads; as a result the big 2000 hp GE diesels have to be taken off the Jakarta/Sourabaja Express half way down the north coast. A pair of diesel hydraulics is substituted and the speed drops from an 80 to 60 km/h maximum. And this line, like most in Indonesia, cuts across every river draining the tropical volcanic range along the spine of the island. Bridge improvement is high on the investment priorities. Similar problems arise in limiting freight car loads. Mr Soedjono's goal is to run 16t axleloads at 120 km/h, everywhere, as soon as he can lay his hands on the investment funds.

But where something better could be done with what was already there, it has already been done, and done well. Pre-Soedjono, there were three 4½-hour expresses on the Jakarta/Bandung run; today there are five, they make the run in 3¼ hours and they are strictly as advertised — non stop, and on time. The GE's are spotless and the cars spick and span. The seat reservation system is still manual but efficient, the on-train catering good, and you can reserve a taxi on the train. They issue you a taxi-ticket and throw out a note, which is phoned ahead. The stations have been done up, the staff have new uniforms and the people smile. This is a railway where the passenger is made to feel welcome.

When the other Bandung Express passes your engine, the crew members have a grin from ear to ear, and their wave is a wave of pride in doing a first-class job. You can set your watch on the time and place the Expresses will pass. These green-and-cream trains thrashing across the padi fields at 80 km/h make a smart sight; the same train slogging on full throttle at a steady 65-70 km/h up the long 1 in 80 climb through the mountains and over the splendid 90m viaducts — yes, 90 metres high — in the misty slopes of terraced ricefields, is a green and brown contour map in three lush dimensions. Its a railway sight — and a train ride — not to be missed anywhere in the world. And the aircon first-class fare is about eight dollars.

The Bandung service is Mr Soedjono's personal pride.

So you may be sure that every aspect of that trip, as duly reflected in system performance — will be faithfully recorded by the responsible PJKA managers — each in his own blue-and-gold copy of Mr Soedjono's Diary.

New chief for rail research centre

Dr James A. Allen A.O., M.Sc., Ph.D., Hon LL.D, F.T.S., F.R.A.C.I., F.A.C.E. F.A.I.M took charge of the Australian Railway Research and Development Organisation (ARRDO) as Executive Director on September 23, 1985. He joined ARRDO after a distinguished career in academia, in semi government bodies at the State and Commonwealth level and in private industry.

ARRDO was created in 1977 as a result of increasing public and government awareness of problems with rail systems throughout Australia. ARRDO operates as an independent research centre examining national issues in three main areas:

- investigation of rail markets and opportunities;
- investigation of rail operations, costs and asset management; and
- collection and maintenance of systematic information on rail transport.

Born in 1924, Dr Allen gained his Ph.D. at the University of Bristol, England after serving in the Royal Australian Air Force in World War II. He then embarked on an exceptional career in research in academia and in semi government bodies and in private industry.

His association with private industry started with his work for I.C.I. (Australia) Ltd., as section leader, Central Research Laboratory and he later continued the association as a Research Consultant.

His time within the academic community saw him rise to the position of Deputy Vice Chancellor of University of Newcastle (New South Wales).

His contribution to chemical research has been outstanding, becoming Professor Emeritus in 1971, President of the Royal Australian Chemical Institute in 1976 and a Leighton medalist in 1978.

In 1971 he took up the position of Executive Officer CSIRO, Canberra, a position he held until 1976.

Dr Allen has devoted much of his talents to the improvement of federal and state education.

He has served as chairman of the Board of Advanced Education, Queensland and been a member of several Commonwealth and Queensland Education Commmittees.

In 1982 he was awarded the Order of Australia for his services to higher education.

Dr Allen's talents extend across a diverse range of areas and demonstrate his concern for the wider implications of science and education in society.

He served as chairman of the Council of Australian Institute of Marine Science 1971-1982.

He is a foundation fellow of the Academy of Technological Sciences, fellow of the Australian Institute of Management and has been president of the Australian Council of Professions.

Dr Allen will bring to ARRDO his considerable knowledge and expertise and will enhance ARRDO's already fine reputation for high quality research.

Ever hear of hearing dogs?

'Hearing Dogs' are specially trained animals which accompany aurally deficient (deaf) persons.

The dogs are permitted free travel on public transport in most States, a provision which has now been introduced by Australian National on passenger services in its sectors. This is additional to existing AN provision for dogs accompanying blind rail passengers. Now both kinds of dog can travel with their owners in passenger carriages.

Hearing dogs are a fairly new concept in Australia.

Anyone can see what a blind guide dog does but what can a 'hearing' canine do, bearing in mind there are 221,930 totally deaf persons in Australia and 19,672 in SA.

The hearing dogs project was initiated in 1975 by the American Humane Society.

The program was introduced into Australia in May 1981, by Lions Clubs of Australia who train and provide the dogs free to deaf persons.

The Australian hearing dog operation is based at Verdun in South Australia.

A program director is responsible for training the dogs and personnel and the general daily administration of the training centre.

In addition there are two full-time trainers and kennel managers, and volunteers attend weekly to help exercise the dogs.

Dogs are obtained through local animal shelters; thus an abandoned or unwanted pet has a chance to provide a lifetime of service to the deaf.

Animals chosen are between six months and one year old. The expected working life of a dog is 10 years.

Over a three-month training period, (up to six months for special requirements) dogs are given obedience training and a sensitivity to the variety of auditory cues such as a baby crying, a smoke alarm, alarm clock, security buzzer, a ringing telephone, whistling kettle, a knock on the door — or unfamiliar sounds which may indicate danger or some other emergency to the deaf owner.

All dogs are trained to respond to hand commands because many deaf people are non-vocal.

The dogs are trained with hand praise, not treats.

After training each dog is delivered by a trainer to its new home.

Then the trainer, dog and deaf person undergo an on-site familiarization and training period, thus ensuring successful placement.

Financially the non-profit project depends on sponsorship and donations.

Complete training, kennel and veterinary care costs about $1500 a dog.

Lions Clubs of Australia have invested $170,000 in establishing the program which is being funded in part by proceeds from Lions Christmas cake sales.

Currently some three dogs a month are supplied to deserving deaf persons in Australia and it is hoped that in time this may be increased.

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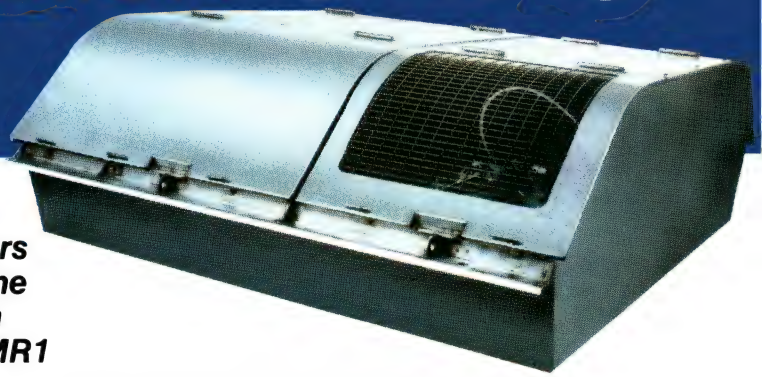

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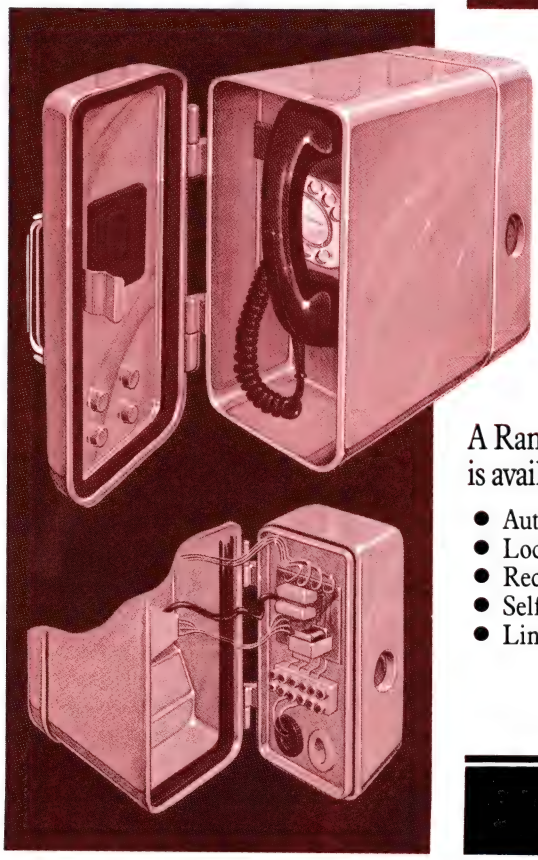
Our unit has a proven track record for reliability and performance in a variety of installations like Railway Communication, Freeways, Remote Locations and Non-Secure Sites.

Queensland Railways and The State Rail Authority of New South Wales currently use the Ansa Weatherproof Telephone extensively throughout their networks.

The Ansa Weatherproof Telephone is your guarantee of reliable, high quality communications under the most trying environmental conditions.



Consider these Characteristics

- Easy Installation
- Compact • Secure
- High Quality Speech
- Telecom Permit No: C84/31/55
- Insulation tested to 3000 Volts
- Robust Construction & Design
- 3 Section Case for Ease of Maintenance
- Australian Made for Australian Conditions

A Range of Options is available including

- Automatic, Magneto or C.B. Models
- Lockable Case
- Recall Push Button
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Ansa can fill all your Communication needs

- Design, Manufacture & Installation of Railway Communication Systems
- Computer Systems & Products
- PABX Installations
- Intercom Systems • Radio Paging
- Maintenance & Repair Services
- Business & Domestic Telephones

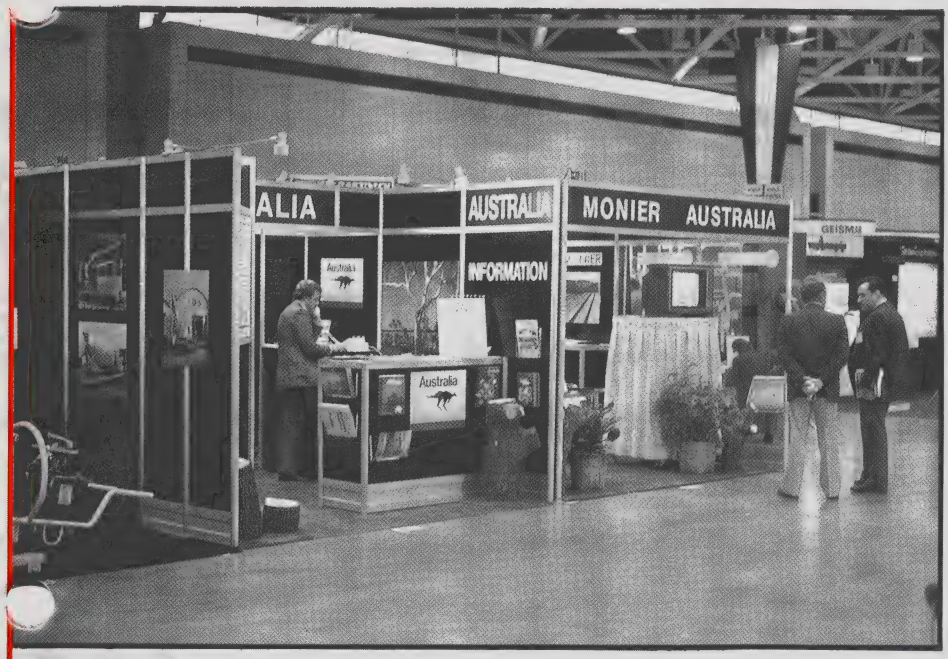
The Ansa Weatherproof Telephone

For further information and technical assistance write or call now.

Ansa

Ansa Pty Ltd,
21 Hudson Road, Albion 4010.
Telephone (07) 262 6222. ANS 253

Australian rail exhibit in Dallas



The Australian exhibit attracted a great deal of interest at the REMSA Show, held in Dallas, USA, in September. Held every four years, the 1985 Show was attended by 2,450 registrants.

Photo courtesy Jim Michel, AMTRAK.

SRA to build $5 million college

Work on the State Rail Authority's new $5 million training college at Petersham is underway.

The new purpose-built college, is the first centre devoted entirely to training the SRA's operations personnel — signalmen, shunters, booking office and station staff and trading and catering personnel.

Chief Executive of the SRA, David Hill, said it was crucial to match the upgrading of track and rolling stock which has cost some $1 billion in the past nine years, with improved training for the people who serve the railway's customers.

'Even though the rail operating areas recruit hundreds of people every year, sadly there has been no proper training facility for them.

'We have centres and training courses for our trade apprentices, our engineers, even our track workers, but until now our station staff — our front-line troops — have had no proper training and development facilities.

'Our staff deserve better training and, frankly, the public deserves a better level of service than they get now in some instances.

The new centre, which has been designed to be environmentally pleasing as possible with large windows and garden courtyards linking classrooms and offices, is expected to be in use by June next year.

Tasrail gets major boost

The fortunes of the Australian National Railways Commission's Tasmanian operations will be revived under a $60 million package of financial assistance announced recently by the Federal Minister for Transport, Mr Peter Morris.

Mr. Morris said the Government had approved a three-year program under which AN's operations can be revitalised.

As part of the program, the Commission has decided to establish a separate identity — TASRAIL — for its Tasmanian operations.

AN will also upgrade its marketing effort by appointing a marketing manager to boost TASRAIL's freight sales and seek out new freight opportunities.

The minister said the Federal Government has reached an agreement with AN to provide $52.4 million over the next three years to underwrite its Tasmanian operations.

'A further $7 million will be provided during this period to complete a major track upgrading program.'

'I do not pretend it will be easy, but I have been heartened by the discussions I have already held with these groups. They are determined to grasp this opportunity.

'However, there is no doubt that if this package is not successful, more severe alternatives will have to be considered.

'So that we are fully aware of the implications of these alternatives, the Bureau of Transport Economics will be undertaking a comprehensive study of the economic and social effects on the Tasmanian community of closure of the network.'

'However, ensuring the success of TASRAIL is a challenge in which I look forward to the co-operation and support of the State Government, the Commission, its employees, unions and customers.

Surveillance contract

Philips communication systems are keeping Australian transport systems 'on line' by providing surveillance and remote observation equipment for some of the major railway facilities in Victoria and South Australia.

A contract has been won by Philips to install a total of 27 Video and 40 surveillance cameras at Adelaide Central, Noarlunga Centre and Salisbury railway stations in South Australia.

These cameras will be monitored in the main control centre at the CTC Building. Coaxial cable will be used to transmit the signals from Adelaide Central.

The south Australian CCTV contract was awarded to PCS by Westinghouse Brake & Signal Co. (Aust) Ltd. which has the contract to supply complete passenger information systems to the State Transport Authority of S.A.

In Victoria Philips have been installing closed circuit TV for the MURL (Melbourne Underground Rail Loop) system. The equipment provides information announcements for commuters and safety surveillance for railway officials.

(continued on page 62)

Australian National's Overland passenger train winds its way through the picturesque Adelaide Hills. The train provides a daily serv between Adelaide and Melbourne and 1986 is the centenary year of construction of the rail line between the two capitals.

AN's other interstate passenger trains include the Ghan, Indian Pacific, Trans-Australian and The Alice.

1986

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F	5	12	19	26		
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Go First Class
Go Goninan

Since 1978, Sydney commuters have been travelling first class in double deck stainless steel passenger cars. Over 300 of these cars designed and manufactured in Newcastle by Goninan are now in service on the Sydney suburban network and over that period have built an enviable reputation for comfort, reliability and ease of maintenance. Goninan engineers, in conjunction with the SRA, have steadily updated their cars by introducing the world's latest and best technologies in design, manufacture and quality control.
With even more improvements in the pipeline, Sydney commuters can look forward to travelling first class well into the future.

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Railway manufacturing survey

The Institute of Engineers National Committee on Railway Engineering as part of their continuing programme of monitoring industry status is undertaking a survey of that part of manufacturing industry in Australia which services the railway industry.

The Committee intends this survey, in conjunction with other analyses, to determine:

- the implications for manufacturing of railway industry expenditures.
- the relative importance of this sector in the general economy.
- the geographical disposition of the industry in Australia.
- sources of technology used by manufacturing industry.

The Committee believes the distribution of the survey results will create a greater awareness of the needs and availability of manufacturing industry and the importance of the manufacturing sector to railways.

Requests for further information or general comments on the topics covered by the survey should be directed to:

Institution of Engineers, Australia
National Committee on Railway Engineering
Manufacturing Industry survey II
National Circuit
Barton, ACT.

All information provided will be treated confidentially.

SRA tackles tunnel noise problem

The State Rail Authority will spend $4.5 m to reduce noise levels in the tunnels of the Eastern Suburbs Railway.

Chief Executive of the SRA, David Hill, said the go ahead for the project follows more than a year of extensive acoustic testing in the tunnels.

Tenders to supply the special sound absorbing panels will be called early next month and the panels installed throughout the entire Eastern Suburbs tunnelling over the next 12 months.

The SRA has been studying the noise level in the Eastern Suburbs Railway tunnels for some time and tests indicate the higher levels in these tunnels compared to the old city underground are due to different building methods.

The Eastern Suburbs Rail has a smaller tunnel profile with harder and smoother walls than the older tunnels.

The higher noise levels have been a source of complaint by members of the travelling public and by staff.

The new acoustic panels are the most efficient way of reducing the levels in the tunnels. The tests confirm perceived noise levels will fall by around 40 percent and the noise energy level will fall by around 80 percent.

With the installation of the panels the noise levels will be well within acceptable standards.

The panels will also be fitted on the Eastern Suburbs Railway station walls to make it more comfortable for waiting passengers.

"The Alice" in Tourism Award Finals

The State Rail Authority of New South Wales and Australian National scored a resounding success with the entry of "The Alice" in the 1985 National Tourism Awards which were presented in Melbourne on November 19. "The Alice" reached the finals in Category 7 - Tour services and Tourist Transportation. This was the first entry by Railways in this prestigious competition. Congratulations to State Rail and Australian National.

Publisher's Note

Commencing with this issue, Vol. 23 No. 1, the quarterly publication of 'NETWORK' will correspond with the normal quarters of the calendar year. This issue replaces Vol. 22 No. 4.

And in Queensland

Brisbane's electric Citytrain services

Brisbane's electric Citytrain services are expected to carry more passengers than Brisbane City Council buses by the end of 1986. Projections based on comparative patronage figures since 1977 indicate that during this financial year, BCC buses would carry 40.6 million passengers to Citytrain's 40 million.

This compared to 41.7 million for buses, and 37.4 million for Citytrain in 1984-85.

In the 1977-78 financial year, Brisbane City Council buses carrie 48.7 million passengers, almost twice the 26 million carried by suburban rail services.

'Urban public transport analysts from the Department of Transport have estimated that suburban rail patronage will pass BCC bus patronage towards the end of 1986,' Transport Minister Mr Don Lane said recently.

'However, the crossover point could occur sooner as the projections were based on historical trends, and do not take into account improvements to Citytrain services that will come on stream by June next year.'

By the end of June the new section of electric track from Thorneside to Wellington Point will be commissioned, and the electrificati of the line from Petrie to Caboolture will be completed.

New stations for Bray Park and Carseldine, announced in the capital works programme in this year's budget, also will be completed next year, adding further to rail patronage figures.

Queensland Railways has started railing phosphate from Phosphate Hill to Bilyana.

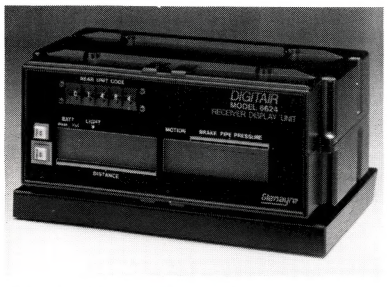
The first consignment was arranged by North Queensland Spreading Services, Babinda for King Ranch, Bilyana, and similar consignments are expected to be hauled in the next 12 months.

Queensland Rail also expects to start carrying phosphate to Inkerman, Koolachu, Ingham and Mackay in the near future.

Phosphate is used on sugar, beef and dairy properties in these areas.

Digitair. The only system you need behind you.

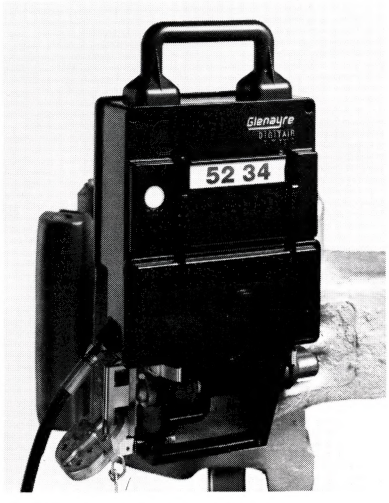
Glenayre's DIGITAIR system is your complete rear-of-train information system. It provides a visual locomotive display of conditions at the rear of the train.



GL6624 Receiver Display Unit

Basic features provided include:

- Locomotive display of brake pipe pressure at the rear of the train.
- Test button and digital air pressure display on rear unit.
- Locomotive display of rear unit battery "weak" and "fail" conditions.
- Loss of communications warning in locomotive.



GL6621 Sense and Transmit Unit

Options recently added to the basic system comprise:

Motion Sensing

- conditions monitored are:
- Moving/Stopped
- Forward/Reverse
- Buff/Draft

Odometer

- provides a locomotive display of distance travelled
- can be calibrated en-route.

Rear Marker Light

- the rear unit can be equipped with an integral FRA standard marker light.

With its innovative microprocessor based design, sophisticated data communication techniques, rugged construction and long battery life, DIGITAIR provides the best communications performance in the industry, performance that is field proven.

DIGITAIR, the only rear-of-train system you'll ever need.

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PLESSEY

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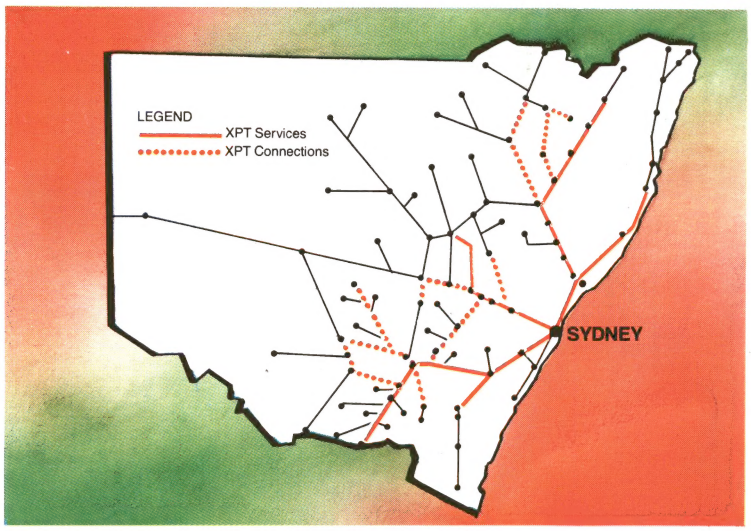
Comeng XPT puts SRA on the map!



Country rail travel in New South Wales is undergoing dramatic and spectacular improvement – thanks to the new generation Comeng XPT.

Introducing a new era in air conditioned comfort, passenger luxury and higher acceleration capabilities, power and speed, the high performance Comeng XPT is the equal to anything available *anywhere in the world.*

Interior features include floor-to-window sill carpeting, panoramic heat deflecting windows, individual reading lights, adjustable reclining seats and many other modern passenger innovations that puts the Comeng XPT right up front with other modern forms of transport!

And this new generation train was designed, engineered and constructed by Commonwealth Engineering for the State Rail Authority – convincing proof of the Company's ability to lead the way now – and in the future – for Australia's passenger and freight transport needs.

Winner of the Chartered Institute of Transport Design Award 1981.

Comeng A train of thought

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